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THE NATIONAL GEOGRAPHIC MAGAZINE

Fishing in the Whirlpool of Charybdis

A Scientist Harvests Weird Creatures Tossed Up from the Depths by Churning Waters in the Storied Strait of Messina

BY PAUL A. ZAHL

With Illustrations from Photographs by the Author

ELSEWHERE that day the Mediterranean was blue and quiet, almost calm. But there was one distinct and isolated patch of sea about seven hundred yards off shore curiously alive with whitecaps. Our little Sicilian fishing boat was heading straight for it, and, closer every moment, I could see the whitecaps breaking into solid foam.

Ordinarily I would have considered it the sheerest folly to venture into the whirlpool area of the Strait of Messina. But wise and staunch old Giuseppe Arena had told me not to worry; he knew the currents, the whirls, the dangerous spots, the safe havens; he'd been fishing the strait for nearly 50 years, and he was still very much alive.

Whirlpools Peril Fishing Craft

Giuseppe gladly accepted the assignment to take me to the edge of the whirlpool area, but I could not help noting the sincere solemnity with which he crossed himself before stepping into the boat.

Here, for a few hours each day at predictable times—especially during the moon's new and full phases—swift tidal currents, deflected by irregular shores or opposing waters, create large patches of live water with vortexes strong enough to swamp anything smaller than a seagoing powerboat.

Since the days of the ancient Greek poet-geographers, the Strait of Messina has been both the fear of mariners and the subject of heroic song and legend. Throughout the centuries it has taken uncounted toll of human life. Scylla (monster or siren, depending on the legend consulted) lived in a cavern of the very cliff I could see only a few miles ahead, jutting boldly from the Italian mainland where the town of Scilla rises. And the monster Charybdis, of famed regurgitative powers, lay waiting in the very turbulence toward which we were heading.

Indeed, at that moment the sea around our little boat seemed to have about it an element of personalized malice. Huge hands of water were slapping thunder against the sides of the boat, and streaming fingers of wetness reached up over the gunwales.

We continued toward the area of whirlpools, nearer and nearer. Giuseppe's oars dug deep into the water, often water that with a careen of the boat wasn't there. We were no further than 30 feet from the area of maximum fury, and I could begin to see the depression of a suction funnel and hear the ominous gurgle of whirling water.

The Author

Dr. Paul A. Zahl, a distinguished American biologist and physiologist, excels in color photography of "miniature monsters." His previous articles in the NATIONAL GEOGRAPHIC MAGAZINE have included vivid portrayals of back-yard insects and marine life of the Bahamas. He has also brought to NATIONAL GEOGRAPHIC readers remarkable camera studies and first-hand observations of the flamingo, scarlet ibis, roseate spoonbill, and a number of exotic rare birds.

In 1939 and 1940 Dr. Zahl led several expeditions to South America. He is an associate director of the Haskins Laboratories, New York City.

< A Deep-sea Predator Glows with Lights Like an Ocean Liner

Myriad strange creatures inhabiting sunless ocean depths generate brilliant patterns of cold light like that of fireflies.

To study these deep-sea goblins, the author spent several months this year at the Strait of Messina, between Sicily and the Italian mainland, where a rich variety of marine life is periodically swept up by whirling currents and strong winds. This issue presents his unique series of color photographs of deep-sea fauna.

The saber-toothed viperfish (*Chauliodus sloani*, left), tenant of the depths a half mile and more down, flashes jewellike light organs and snaps viciously with stiletto teeth. Among the tiny creatures of the deep, this 14-inches seems formidably large.

v Three hatchetfish flee the slashing jaws of pursuing viperfish in this reconstruction of a daily undersea tragedy.

"Whose mouth is bigger?" asks Eda Kristin Zahl (left), the author's 5-year-old daughter, who holds a dead viperfish.

Kodachromes by Paul A. Zahl

The boat was rocking as I stood up for a last and better look at the vortex. I lost my balance and toppled backward—not quite overboard. My camera, held wrapped in a heavy sweater for protection against the spray, was forgotten. I caught Giuseppe's look again. But only when I began to feel the boat unassistedly heading in a circular direction on the whirlpool's outer brim did I hastily motion Giuseppe to reverse our course. I had no wish that day for a more intimate grapple with Charybdis.

My wife and small daughter were waiting for me on the shore. My wife's face was strained; she knew the basis for the legend of Charybdis and had been watching as our boat tossed within a gulp of the monster's mouth.

But 5-year-old Eda, who had been busy beachcombing, was obliviously radiant. She screamed joyfully as I jumped out of the boat, and, running to me, held forth the contents of her hands for me to examine. I bent down to look at her treasures—about a dozen small fish, each no longer than one of her fingers. Their bellies had tiny white or blue spots that shone brilliantly in the sun; they had the huge eyes and the fierce-looking mouths often characteristic of fish from the depths—which, indeed, they were.

These had been thrown up on the beach by the same swift currents that had created the whirls off shore. They were fresh; the gills of some were still moving.

Seas Pour Two Ways Through Strait

A glance at a map of the Mediterranean shows the northeast tip of the tricornered island of Sicily almost touching the mainland of Italy (page 585). Here, near the Sicilian city of Messina, the two land masses are separated by a strait about two miles across at its narrowest. Southward from these narrows the Strait of Messina opens into the Ionian Sea; northward, into the Tyrrhenian Sea.

These two seas are deep; in places the Ionian descends three miles, and the Tyrrhenian drops beyond the two-mile mark. But the narrow connecting channel between Sicily and the toe of the Italian boot is relatively shallow, as are the immediately adjoining waters. Depths of scarcely 300 feet are found in the channel.

When the tidal forces of moon and sun tug at the Ionian Sea, slightly raising its level, its waters flow northward for a few hours through the strait into the temporarily lower Tyrrhenian Sea. As the moon passes on over the Tyrrhenian Sea, the water ebbs in the reverse direction; at certain times and places the north and south currents sideswipe (page 590).

For ages these two connected seas have been tipping up and down, flowing back and forth through the Strait of Messina. Twice a month, when moon and sun are aligned so that the gravitational force of one is added to that of the other, a maximum tide occurs, and the currents in the strait attain such speed and power as to create areas of violent surface turbulence and dangerous whirlpools.

Deep-sea Creatures Stranded on Beaches

Not only do the surface waters react thus. Because of the topography of the sea floor in this region, waters farther down also feel the solar-lunar tug, and they too begin to move. When these deepwater currents strike the barrier shallows at Messina, they are violently deflected upward, forcibly dragging with them a host of organisms from below.

Hence, for these few hours twice a month the surface waters in the Strait of Messina abound with living or half-living creatures whose habitat is normally down where all is black and still. Here at the surface these involuntary visitors from that vast, mysterious world soon expire and are either cast ashore by wind and surf or are gobbled up by sea birds that knowingly hover over the strait, or by other surface predators. None from the deep survive.

After a strong onshore wind I have seen beaches along the Strait of Messina littered with thousands of tiny dead or dying creatures whose strange appearance would make even artist Dali wince. I have seen multitudes of sea gulls and puffins waiting aloft for the uprising currents to deliver doomed fishes, squid, and shrimp to the surface (page 584).

Past published accounts of deep-sea expeditions have, for good reason, been illustrated only with paintings or with black-and-white photographs of preserved or dying specimens from great depths. When I mentioned to the editors of the NATIONAL GEOGRAPHIC MAGAZINE my desire to seek deep-sea fishes in the Messina whirlpools, and to have my cameras and lights set up at a shoreside laboratory in order to photograph my catches immediately after they were taken from the sea, before they could die or deteriorate, they agreed that if it could be done we would have a

Kodachrome by Paul A. Zahl (enlarged 8 times)

Saber-toothed Viperfish from Mediterranean Depths Bares the Fangs of a Primeval Tiger

Luminous patches gleam inside jaws. Teeth bend under pressure, but easily pierce soft bodies of deep-sea victims.

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Fish-hunting Gulls Wheel and Soar Above the Turbulent Strait of Messina

Marine life forced to the surface by churning currents attracts these sea birds. Wild water like this might swamp a small boat, but offers no threat to the ferry from which the picture was taken.

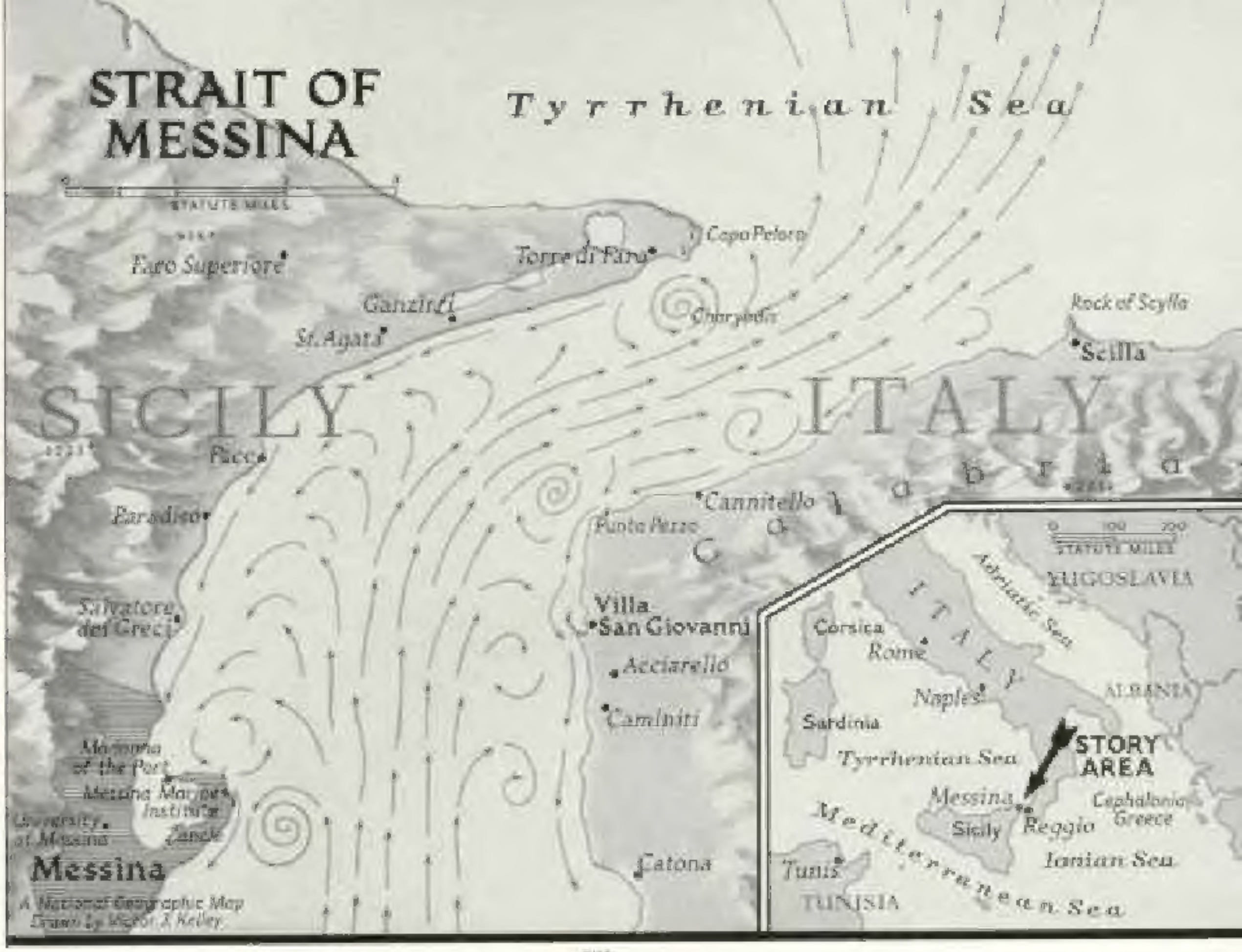
most unusual set of "firsts." If not, well, you can't shoot a man for trying. The National Geographic Society elected to sponsor the project.

Deep-sea Fishes Wear Lights

I wished also to make a comparative life study of the luminescent organs known to characterize the majority of deep-sea fishes. On the bellies and sides of pickled museum specimens I had seen light organs that had once illuminated the blackness of the depths, lights that had long since been extinguished. Lights aglow on living deep-sea fishes, on the other hand, are something that not many people have seen. I was stirred to think that without a bathysphere, but with the help of the Messina currents, I might be able to see such luminous fishes up close.

Much preparation was necessary. New photographic techniques had to be improvised on faith, for at home they could not be definitively tested. Only there on the spot at Messina would I be able to ascertain whether my improvisations were sound. Such blind but hopeful preparation took about three months in New York.

I had been graciously invited by representatives of the Italian Government to make my headquarters at the Istituto Talassografico di Messina (Messina Marine Institute), which stands at the edge of the strait within a stone's throw of one of the largest whirlpool areas. The director of the Institute, Professor Antonio Sparti, had written that his Institute had suffered much from bombing during the war. But reconstruction was well under way, and I would be welcomed.



Ancient Mariners Feared These Whirling Waters, the Home of Scylla and Charybdis

Powerful and swiftly reversing tidal currents race through the narrow channel. Countercurrents develop in the lee of headlands. Whirlpools form wherever current and countercurrent meet, or where they encounter irregular depths. Ionian water is colder, saltier, and denser than Tyrrhenian. Where the two water masses clash, upwelling and subsidence occur. All these factors combine to produce Messina's dread turbulence.

The whirlpools stay in relatively constant positions. Homer's Charybdis, however, no longer swirls a "bowshot" away from the rock of Scylla; it now eddies 1,100 yards off Capo Peloro Lighthouse. The shift may have been caused by violent earthquakes.

This map is based on a simplification of the strait's complex currents by oceanographer W. E. Maloney of the U. S. Navy Hydrographic Office. Currents run about six hours as shown, then reverse.

In addition to the good offices and confidence of the National Geographic Society, letters in my behalf were written by the Italian Ambassador in Washington, His Excellency Dr. Alberto Tarchiani. Dr. Michael Lerner, the noted angler, generously aided in clearing the various obstacles inherent in any foreign survey of this sort.

My wife and I and our small daughter arrived in the city of Messina on January 1, 1953. This was to be our home for the next two or three months—this Messina which, with thousands of its inhabitants, had been destroyed by an earthquake in 1908; which during the recent war had been largely leveled by Allied bombs; which had built itself up again and was showing a new face in the form of shiny store fronts, modern buses, an increasing number of automobiles, and a neon-lighted Via Garibaldi.

On our arrival in midwinter, when the mountains rising behind Messina and on the other side of the strait were snow capped, and when Sicily was anything but sunny, this city of 221,000 smiled the sad-gay smile of the brave who have known suffering.

Sicily in the winter of 1953 was much colder than we had expected. My lightweight suits and tropical shirts remained packed during our entire visit. In the shelter of our hotel quarters, as well as in the laboratory, I was rarely without jacket, sweater, muffler, and gloves. Just try to focus a camera with gloved hands!

We had scheduled our visit at this time of the year primarily because January through March, according to all reports, is the most favorable period for finding deep-sea fishes in the strait. Why winter should be better than

(Text continued on page 591)

Author and Daughter, Beachcombing on Sicily's Shore, Watch Whirlpools Rack the Strait of Messina. Italy's Toe Lies Beyond

Each morning Dr. Zahl, with collecting jar and camera, sought rare deep-sea specimens washed up on the beach. Here he views the mainland town of Villa San Giovanni and the Messina-mainland ferry (on horizon). Hidden beyond the distant headland juts the rock of Scylla, dread monster of legend (page 568).

Deep-sea Squid Stare with Enormous Eyes

Squid of many kinds abound in all seas. Some, 50-foot giants, battle sperm whales and give rise to sea-monster legends.

→ Others, such as *Rossia macrosoma*, can perch on the end of a pencil.

Like its octopus cousin, the squid mastered the arts of jet propulsion and smoke screening long before man dreamed of such things. Water squirting through a funnel propels the animal, and clouds of ink confuse enemy pursuers, possibly paralyzing their sight and smell.

← *Heteroteuthis dispar*, a deep-sea variety scarcely bigger than a man's thumbnail, protects itself by shooting clouds of luminous fluid. Numerous other deep-sea squid illumine the depths with living candles like those of the viperfish (page 580).

Chromatophores, or color cells, form reddish freckles on these three. They can expand or contract with lightning rapidity to change the creature's color.

Kodachromes by Paul A. Zahl

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* An Abandoned Castle Overlooks the Tentheniat Sea from Sicilia's Legendary Rock. Sciara Village (Right) Produces Wine and Silk

[illegible]

any other time of the year has not been established, although it is thought that many deep-sea species tend to migrate vertically during these months and so are more likely to be caught in the upflowing currents. This vertical migration may be associated with the spawning pattern.

The inclemency of the weather turned out to be a disguised blessing. Some observers believe that many surfaced deep-sea fishes die not because of the decreased pressure but because of the increased temperature. The surface waters of the strait, usually quite temperate, were at 50° to 52° Fahrenheit during the winter of 1953, not much different from the known temperature of the Mediterranean deeps. Thus, fishes brought up from the depths were not subject to the extreme thermal shifts of those caught, say, in a deep-sea net haul off Bermuda. The cold water of the Strait of Messina in January and February helped keep many of my catches alive for hours.

If, on arrival at Messina, I thought that these fishes were going to be handed to me on a platter, I was to learn better. Within a day or so I had my equipment set up and ready; my tanks were full of cold circulating strait water; my notebooks were open and the cap was off my fountain pen.

Giuseppe, my right-hand man, saw my eagerness. He shook his fine Sicilian head and kept repeating: "Quarto di luna . . . quarto di luna." My knowledge of Italian then was shaky, but I soon gathered that he meant it was now quarter moon and there would be no deepwater specimens until the moon had gone into its full phase. Giuseppe confirmed my interpretation by making a circle with his fingers, and explaining with great promise: "Luna piena—molto materiale." Full moon—much material.

But there was another requirement for "molto materiale." Next day Giuseppe explained it to me, with the translation help of young Francesco Li Greci, an English-speaking Italian student of zoology at the University of Messina, who had dropped in for a visit. Giuseppe pointed southward and kept repeating the word "sirocco." By this he meant that, although deep-sea currents during the full moon would bring hundreds of specimens near or to the surface of the strait, a strong south wind, or sirocco, was needed to concentrate them so they could be found.

This concentration would take place mainly in waters along a shore line jutting into the strait from Messina northeastward, arcing to a land's end where Capo Peloro Lighthouse stands. Along this barrier the sirocco would pile up, first in offshore waters, then on the beach, anything floating through the strait. Without this south wind, the thinly dispersed deep-sea organisms would be swept through the strait and into the Tyrrhenian Sea, the while being set upon by hungry gulls. So I covered my aquaria and put the cap back on my fountain pen. The full moon was not due for four days.

Visit to a Monster's Lair

While waiting I took my family on a ferry ride across the strait to the mainland of Italy. We disembarked at Villa San Giovanni and walked a few miles up the vineyard-terraced coast until we came to the picturesque village of Scilla, clinging to the side of a high bluff. A great bare rock mass, part of the village cliff, rose sheer more than 100 feet out of the sea. This was the rock of Scylla, of Homeric fame, where dwelt the fearful monster (page 588).

We sat by the road to eat our lunch and contemplate the spectacle. I pulled a notebook from my pocket and read aloud an entry which I had made a month earlier from the Encyclopedia Britannica:

"In Homer Scylla is a dreadful sea-monster . . . with six heads, twelve feet, and a voice like the yelp of a puppy."

I saw little Edu's eyes beginning to pop as I continued:

"In later authors and in art she is a mermaid, with dogs' heads springing from her loins. She dwelt in a cave in a high rock, out of which she stuck her heads, fishing for

◄ Strange Life Cast Up by Wind and Tide Litters Beach and Fisherman's Nets

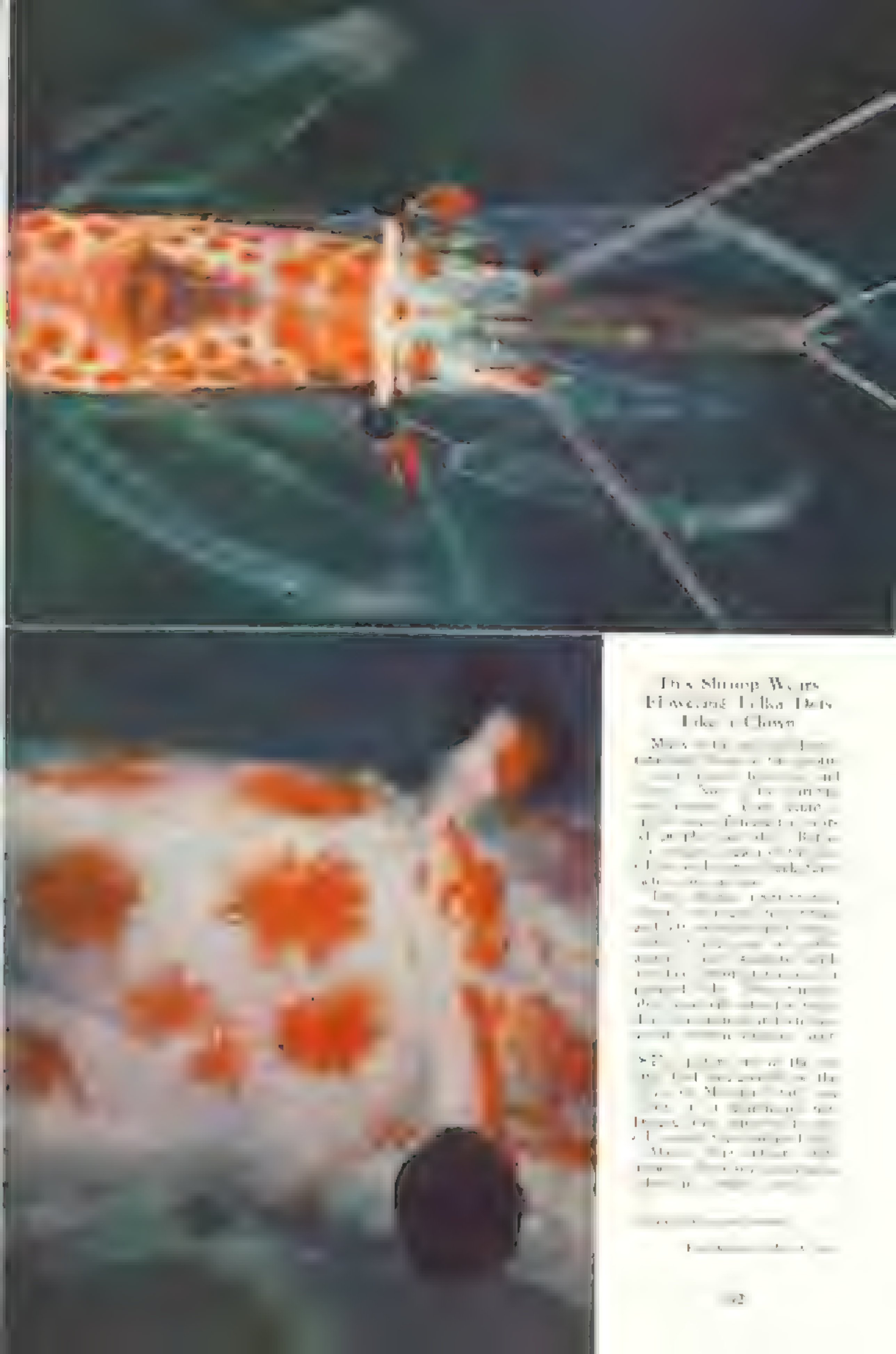
Homer, in the *Odyssey*, tells how Ulysses was threatened by alternate perils: Scylla, a snake six-headed monster dwelling in a cliffside cave, and Charybdis, an undersea monster living near by, which thrice daily sucked the sea into a frightful whirlpool.

Navigators in the Strait of Messina no longer credit the legend, but they still avoid Scylla's castle-crowned promontory and the turbulent eddies caused by conflicting tidal currents from the Ionian and Tyrrhenian Seas (page 590).

These currents bring to the surface countless deep-sea creatures which the southeast wind blowing from the south, drives shoreward.

The author (above) shows his daughter a particularly interesting specimen. Current in the immediate foreground races to the left, creating whitecapped whirlpools where it shears against countercurrents.

Sicilian fishermen (below) sort fish from nets cluttered with jellyfish and plankton.



Dry Shrimp Wears Flowering Lotus Hats Like a Crown

marine creatures and snatching the seamen out of passing ships. Within a bowshot was another rock under which dwelt Charybdis, who thrice a day swallowed in and thrice spouted out the sea water.

But little Eda takes fairy tales with some skepticism. Her eyes were on the rock and the near-by village. "Why do all those people live in that town, if the monster is so terrible?" she asked.

"Let's go find out," I replied, closing my notebook. We got up and headed for the rock of Scylla.

Half an hour later we were on the summit, having followed an easy path up the side. At, we found there were an abandoned castle, a few government weather instruments, and a magnificent view of the Tyrrhenian Sea.

This could have been a day of anticlimax for the child, but it proved not to be so, for a little while later down on the beach we found as authentic a monster as anyone could ask for—many monsters, in fact.

Miniature Monsters of Scylla

We were strolling on the gray sand, and Eda was busy looking for shells. Suddenly I saw her stoop and pick up a tiny silvery object. She examined it closely, then called to me in matter-of-fact tones, "Daddy, here's that monster. Look at its horrible mouth and eyes, and the fire on its stomach."

By this time I had reached her, and I soon recognized that what she had found was an *Argyropelecus* (page 596). Although it is sometimes caught near the surface, *Argyropelecus* migrates vertically and ranges down to considerable depths.

There had been an onshore wind all morning. Any fish brought up from the deep by pre-full-moon currents—fish that normally with a sirocco would have landed on the beaches of Sicily across the strait—were that day being washed ashore here on the beach of Scilla.

The creature in Eda's hand was only an inch and a half long and quite dead. What produced its monstrous aspect were the gaping cavernous mouth and the closely set, black-appearing globular eyes that extended up out of the head. Part of the skull was transparent, clearly revealing the brain. On the underside of the thin body were lines and packets of light organs, reflecting bright red.

The creature's diminutive size made no difference; here was a monster which to the child was far more convincing than any legend. We continued walking along the beach, and, although we found no other deep-sea species that day, we picked up at least a dozen uniformly weird specimens of *Argyropelecus*.

Today, months later, if you ask Eda what monster lives at Scylla, she will, without batting an eye, reply, "Argyropelecus."

Full Moon Spins Whirlpools

When full moon came I patrolled up and down the beach near the Institute almost the whole of the first day. At 8 in the morning the sea was calm and the air cold. Fishermen in small two-, four-, or six-man rowboats not far off shore were casting nets for market fish.

About 10 o'clock I noticed the water near shore beginning slowly to move parallel to the beach in the direction of Messina harbor, about half a mile westward. This seemed to be a signal for the fishing boats to head for port; they now began to move Messina-ward, riding close to shore on the current, which was gradually growing more rapid.

By 11 the sea was clear of small craft. The current was now a rampaging river.

By 11:30 an area of curiously jumping whitecaps began to develop about 200 yards off the Institute beach. On its near side the sea was still sweeping in the direction of the city harbor; on the far side it moved in the opposite direction. Where these two opposing currents sheared against each other a foamy turbulence was developing, which I could make out as a long series of whirlpools, some only a foot or two in diameter, some 10 or 12 feet across (page 566).

Elsewhere in the strait—off Ganzirri, off Punta Pezzo, off Scilla, but too far away for me to see without binoculars—similar areas of turbulence were also arising, I was told.

I was so impressed by this spectacle of

(Text continued on page 603)

Deadly Tentacles of a Delicate Medusa Ensnare a Hopless Fish

These scavenging polyps are no bigger than almonds. As they drift, their threads coil and drop like elevators, waiting to throw hundreds of stinging hairs into any prey coming within reach. Once paralyzed victims are securely coiled into the animal's body.

Yellowish medusa at right has injected a marine worm, whose body may be discerned. Rows of light organs on the captured fish help identify it as a visitor from the depths (page 611).

Silver Elizabeth Watches This World Through Astonished Eyes

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Deep-sea Fishes, Living in Eternal Night, Carry Flashing Torches Which May Lure Prey, Repel Enemies or Signal Friends

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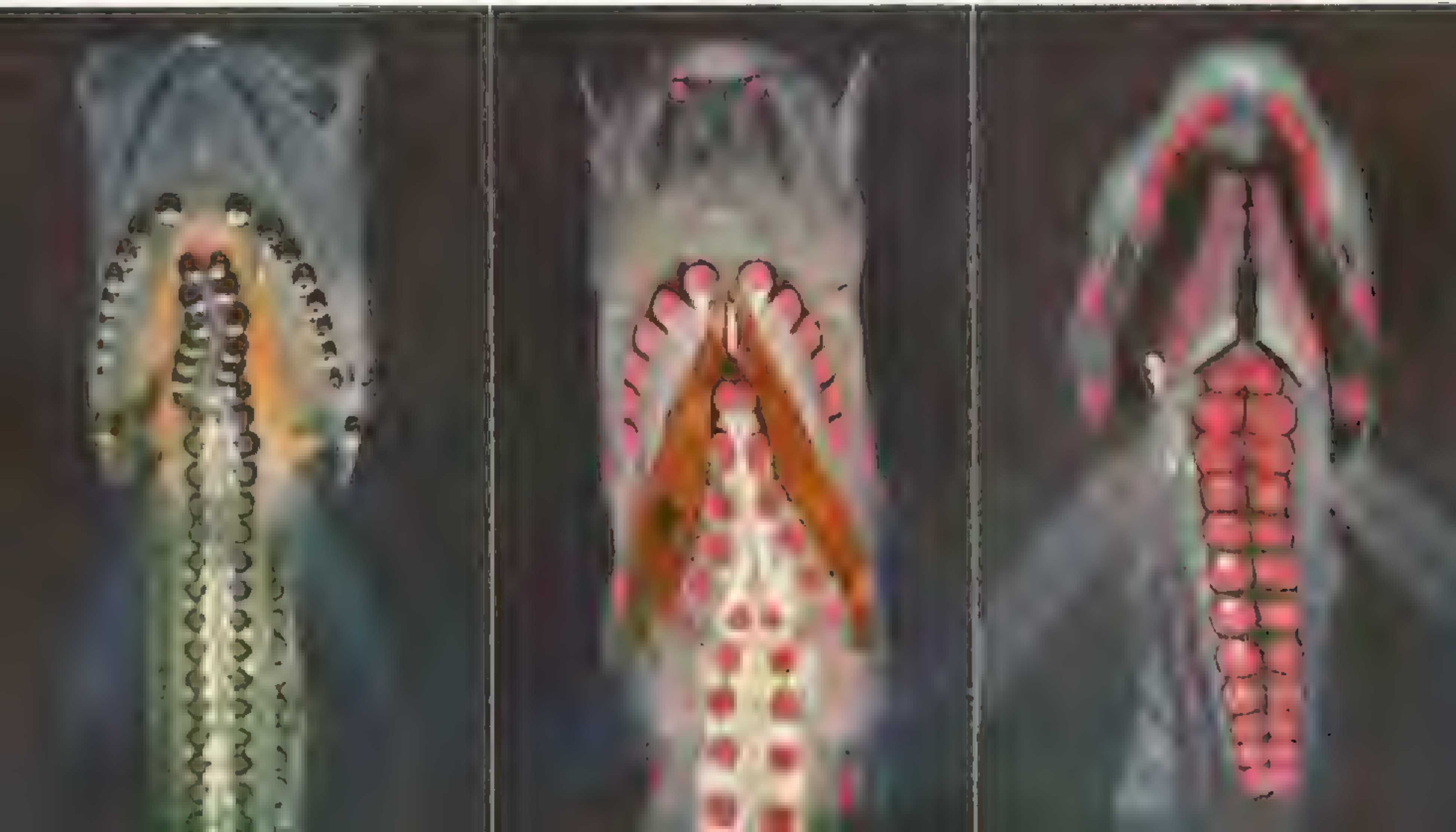

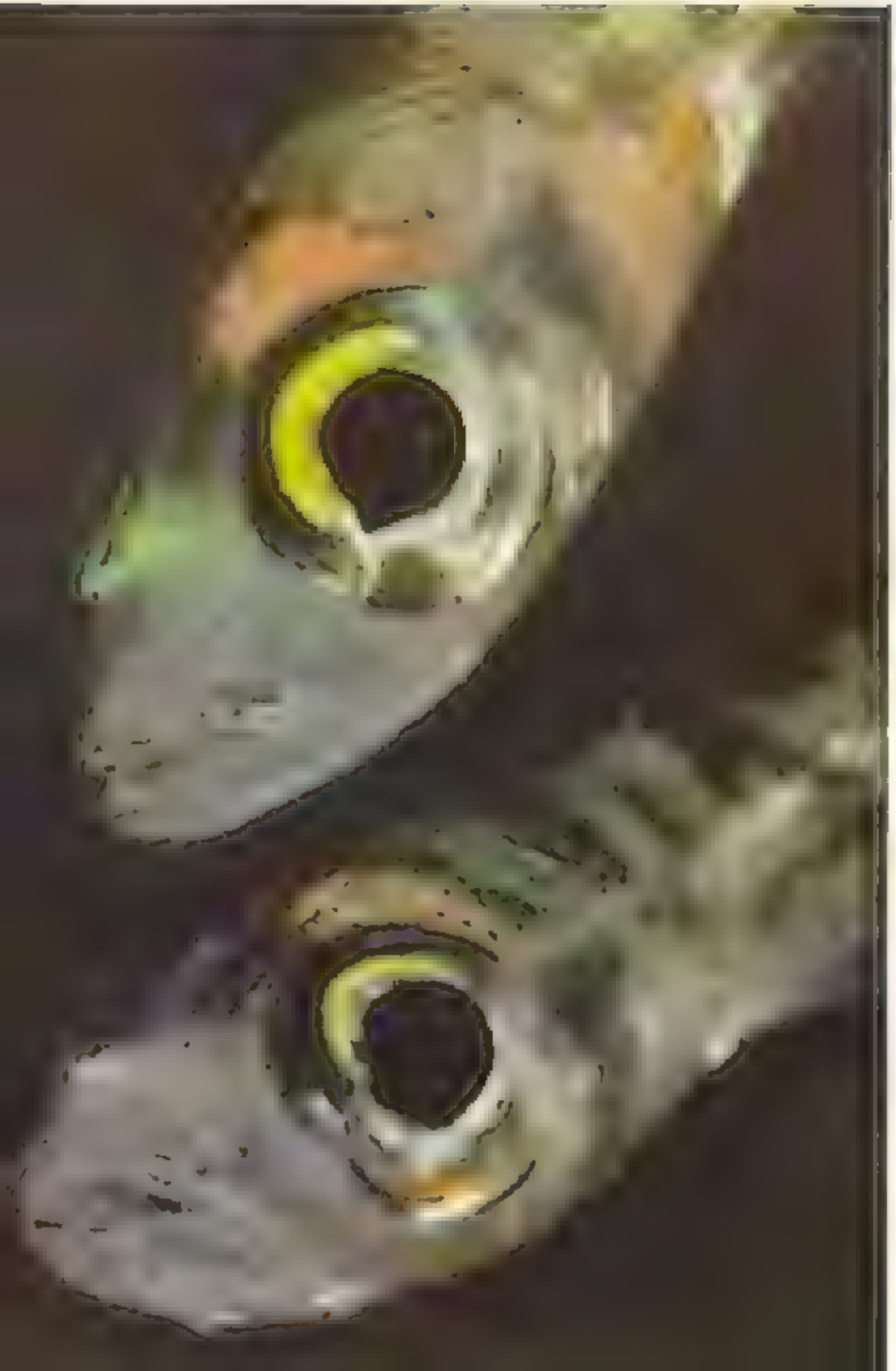

Effects on a Snaky-Headed Mask an Effect of Reduced Pressure

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the whirlpools close at hand that I hardly noticed there was no wind. That was bad, said Giuseppe, who was watching on the sea with me. Without a sirocco we would have a hard time getting any large number of specimens.

By 12:30 the turbulence began to abate. Giuseppe, who by this time had brought nets, collecting jars, and buckets from the Institute, was instructing the workmen to help shove his boat off the dry beach and into the water. He seemed to be in a hurry. "The gulls," he said to me in Italian, "will get all the scopelids [a large family of deep-sea fish, highly edible] before I've had a look."

I had been watching hundreds of sea gulls and puffins hovering over the whirlpools. Diving and rising, diving and rising, they looked like a swarm of mad bees.

Soon the men had the boat afloat and Giuseppe was off. I didn't go along the first day, for I wanted to ready my equipment in the laboratory in case he brought back specimens. But for a few minutes I watched. Giuseppe rowed into the area which had an hour earlier had been alive with whirlpools. There he gave the boat free rein and hung over the bow holding ready a fine-mesh dip net. Repeatedly I saw him dip and transfer something into the jars. After a time I saw him drop a circular-mouthed troll net overboard and then begin to row again.

I left him so engaged and returned to my laboratory. About midafternoon there was a knock at the door and Giuseppe entered. "The birds didn't get all the fish," he announced with obvious pride as he placed two collecting jars on my work bench.

If I didn't gasp, I certainly should have, for in one of the jars was a magnificent individual of a species I was familiar with only from textbooks—*Chauliodus sloani* (page 580). In the other jar were at least 50 much smaller fish, many floating near the surface, dead or dying; others still swimming about.

But my eye was mainly on that *Chauliodus*.

Fluorescent Crustaceans Rival Walt Disney Creations

These crabbie monsters, which could hide behind a grain of wheat, carry red eyes on stalks and some with uncanny purple. During great fishing in Messina's waters, the boat's light attracted swarms of them, their paths forming webs or lightning streaks. Countless billions of animals like these keep latest deep-sea stragglers from starvation.

© Author of Geographic Society

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He was a scaly creature with a head like that of a saber-toothed tiger, easily justifying his common name: the saber-toothed viperfish. About 10 inches long, he seemed at that moment to be enjoying very good health, which is certainly remarkable considering that he was now probably a half mile or so from home, vertically speaking.

Glass Rod Annoys Viperfish

Quickly I transferred him to a large tank of running sea water. There on his belly and sides I saw lines of bright blue-white light organs glowing or reflecting like so many stars. I gently prodded the creature with a glass rod, and his mouth opened to incredible dimensions, just as shown on page 583, revealing not only the most astounding teeth I had ever seen in fish or mammal but also a previously hidden set of purple-blue light organs lining the base of the mouth.

Then suddenly, with the speed and viciousness of an infuriated cobra, his mouth snapped shut in the direction of the annoying glass rod. Now the lower teeth extended beyond the upper lip, and the upper teeth below the lower lip. Some days later, with another specimen, I put on this glass-rod demonstration for my wife and little Eda. As a result I had to wait weeks before I could persuade the latter to pick up a harmless dying viperfish and pose for a picture.

So vicacious is this creature that sometimes a netted specimen was found in the process of swallowing another fish nearly half its size; nor as *Chauliodus* died would he release or disgorge his victim. The jungle ethic of eat or be eaten was never more realistically illustrated. The largest viperfish we caught measured 14 inches in length and weighed about half a pound. The longest any specimen lived in my tanks was eight hours.

But ferocity bears no relation to size in this world of marine furies. In Giuseppe's other jar were adults of a genus known as *Cyclothone*, about an inch long, almost transparent, incredibly delicate, and as innocent looking as guppies—until they opened their mouths. In these Lilliputian monsters the ratio of mouth to body size exceeded that of any other deep-sea fish I encountered (page 611).

As in *Chauliodus*, when the great maw was agape a whole battery of tiny glowing light organs was revealed; when the mouth closed, these disappeared under the gill shield.

Mrs. Zal L. Sketches Deepsea Specimens at Messina Laboratory

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The rarest species were found only during the maximum currents of the full or new moon. In our subsequent days of collecting, however, dead or dying *Argyropelecus* could be seen on the beach, or live ones could be netted from the boat regardless of moon phase. The abundance of this genus was possibly related to the fact that its habitat is not as deep as that of some of the other forms, or because at that time of year its vertical migration upward is greater than that of most other deep-sea fishes.

There were many of these hatchetfish in Giuseppe's other jar that first day. Their eyes, as I had seen at Scilla, were relatively enormous crystalline globes backed by black retinal tissue; situated close together on the head, they pointed in an upward direction like telescopes.

This strange visual adaptation presumably enables the fish to school vertically or to feed from below either on food matter that is drifting downward, or on other organisms. A fierce predator, it has a capacity indicated by the dimensions of its open mouth (page 596).

Fish with Fluorescent Lights

Perhaps the most striking feature of *Argyropelecus*, though, is its light organs. In neatly lined packets, like kernels of corn, they are distributed mainly on the fish's thin belly surface. Like searchlights, they are equipped with brilliant reflectors aimed downward. In daylight these batteries of searchlights appear red, as we saw at Scilla, with a shimmering, iridescent, fiery quality. Under one of my tungsten camera lights they turned bright purple. The color registering on Kodachrome tends to resemble that seen in daylight, although the fluorescent other-world quality was only partially captured by the film (pages 598 and 599).

Furthermore, what the film sees is probably not primarily light produced in the tissues, but rather that being reflected from the outside. Of the hundreds of deep-sea fishes equipped with light organs that we caught in subsequent days and examined in total darkness, only a few—and these inconsistently—glowed with true self-generated light. This was no doubt due to the fact that the specimens, although still alive, were far from their natural environment, far from the physical, chemical, and biological conditions prevailing in the deep.

Self-generated light was most often seen during night fishing, which we undertook later in our stay at Messina. In the process of removing tiny specimens at night from the dip nets, I would sometimes accidentally squeeze one. Under these conditions, little stars on some species would for a few seconds glow to brightness, then fade.

Pencil Activates Light Organs

No amount of stimulation with adenosine triphosphate (a chemical known to activate the luminescent material of fireflies) would induce light production in the laboratory, even when injected under the skin. Sometimes, however, the simple expedient of touching a swimming fish with the end of a pencil or glass rod would cause a sudden flare-up of the light organs.

How is this light produced? The light organs of some fishes are full of luminescent bacteria that seem to produce the primary glow, the fish merely supplying the housing, the sustenance, and the reflector. In other fishes the illumination is produced not by bacteria but by the interaction of enzymes developed by special tissue cells comprising the light organs. But the details of either process in fish are obscure.

That the light organs of these creatures glow with great intensity in the depths is unquestioned. What their actual purpose is in the normal life of a fish, and indeed how they function, are questions that biologists have probed and speculated upon for years. Are they lures, are they blinders, are they signposts for species or sex recognition, are they lanterns for actual illumination—or all three?

Whatever the answers to these difficult questions, lights of red, pink, white, purple, and blue displayed by a thousand species of fishes, squid, shrimp, and other deep-sea dwellers, must make the underwater world one of Tiffany splendor.

While the coldness of Messina's 1953 winter favored our work, the infrequency of the sirocco during January was a decided handicap. Without such a wind sweeping across the Mediterranean northward from Africa—sweeping, especially, the surface waters of the Ionian Sea into the narrow funnel of the Strait of Messina—maximum concentration of deepwater fishes could not occur. Furthermore, in the absence of strong wind, fish-eating sea birds had complete freedom to get at each tidal harvest before we could.

A Repeved Creature of the Deep Bears ONE More than He Can Chew

[illegible]

Another Monster of the Deep? This Baby Shark Is Seven Inches Long

[illegible]

Heaving Against Nets, Sicilian Fishermen Gather the Strait's Scaly Harvest

[illegible]

But we did not want [illegible] every day [illegible] the [illegible] [illegible] [illegible].

Compensation from the Birds

We were [illegible] recently [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible] [illegible] [illegible] [illegible].

In spite of this [illegible] we managed to obtain some natural [illegible] from the [illegible] [illegible] [illegible] [illegible] [illegible].

Finally in February we were [illegible] of the [illegible] and [illegible], [illegible] [illegible] [illegible].

Our [illegible] was [illegible] long [illegible] the beach of the fishing village of [illegible] [illegible] a few miles north of Messina. These [illegible] [illegible] [illegible] the [illegible] [illegible] up on the sand.

Just [illegible] [illegible] [illegible] [illegible] [illegible].

[illegible] of the [illegible] of Italy [illegible] the [illegible] and Villa San Giovanni. All the [illegible] are fishermen.

[illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

[illegible] are [illegible] of the [illegible] [illegible] [illegible] [illegible] [illegible] fishing industry [illegible] [illegible] [illegible] [illegible] [illegible].

Giuseppe Arena, the Author's Assistant, Displays His Catch

[illegible] Messina [illegible]

[illegible] least a thousand watts. It would not [illegible] deep-sea fishes, but would serve mainly to illuminate them [illegible] otherwise pitch-black waters.

Now we were in the Strait, Giuseppe [illegible] toward [illegible] which he considered [illegible]. [illegible] might have been [illegible]. Actually [illegible] was no new experience for me; I had [illegible] in the waters of the Gulf Stream off Bimini.* But [illegible] here in the Strait of Messina proved [illegible] a sight than had its Caribbean counterpart.

Fireball of the Ocean Depths

[illegible] of the [illegible] under the light. I [illegible] of these [illegible] sight [illegible].

[illegible]

[illegible] shaped like [illegible] and the [illegible]

Then there were [illegible] and [illegible] glowing [illegible] of living [illegible] sometimes two feet long. There were also the [illegible] With tentacles trailing and [illegible] pulsating they and [illegible] under the light [illegible] None of these [illegible]

Fish [illegible] across the water. I looked [illegible] of their [illegible]. While one [illegible]

---

* See "[illegible]" [illegible] National Geographic Magazine, [illegible]

Elephant-Faced Mudfish with Teardrop Eyes Resembles a Child's Stuffed Toy

[illegible]

* Pygmy Rorqual Opens Jaws Like a Troop-Landing Barge

[illegible]

* Red Larvae, Makers of Living Lacate, Can Hide No Secrets from the World

[illegible]

Net Poised, Giuseppe Fishes by Gaslight

[illegible]

Mingled [illegible] with [illegible] we [illegible]. Women were stretching, and the [illegible] had changed [illegible] the [illegible] creatures. Now [illegible] bubbling [illegible] large [illegible] of white [illegible] in the [illegible].

[illegible] colors [illegible] and purple [illegible] magnificently [illegible] from darkness into light, then into darkness again like [illegible] in summer.

Eel larvae were there, [illegible] transparent that only their eyes could be seen [illegible]. [illegible] Giuseppe [illegible] I knew that these [illegible] were relatives of [illegible] to the light as [illegible] the world we saw [illegible]. Indeed, I [illegible] long since [illegible] of [illegible] for [illegible] I would [illegible] have forgotten all about the [illegible] we were seeking.

Finally we began to [illegible] and [illegible] of the [illegible] to [illegible]. But when Giuseppe [illegible] them to me, I was disappointed. There was just under the surface a narrow, little silver-like fish, no longer than the first joint of my thumb. It wasn't swimming actively, just seemed to [illegible] with the currents of the [illegible] Sea.

[illegible] together [illegible] with a [illegible]. [illegible] I [illegible] had intended.

Not [illegible] Giuseppe [illegible] part. They are [illegible] and [illegible] wait for a [illegible].

[illegible] I knew that [illegible] in their [illegible] winter when [illegible] on the shore, will [illegible] with [illegible] of the [illegible] for the family table. Giuseppe [illegible] the [illegible] light [illegible] the [illegible].

[illegible] Looks Like a Minnow

Quickly Giuseppe had it in his [illegible] and [illegible] to show [illegible]. I took the [illegible] wriggling thing in the palm of my hand. [illegible]

Like a Circus Performer, *Pterotrachea* Swims Upside Down Through a Wedding Ring

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Owls of the Deep-sea Twilight

[illegible]

[illegible]

Going, Going, Gone! Sea Anemone Gulps a Silverside

[illegible]

[illegible]

Actually, even in the blackest abyss of the ocean, for below the twilight zone, there are few fish without eyes—the reason being that eyes are useful there in order to see the luminous organs of creatures to be eaten or avoided. Aquatic inhabitants of caves on land, on the other hand, tend during evolution to lose their eyes, for there is little bioluminescence in cave waters.

Pressure in ocean depths is, of course, enormous. Yet most deep-sea creatures seem quite indifferent to it, equipped as they are, in the main, with adaptive mechanisms that automatically equalize intratissue pressures with those of the surroundings. Consider the problem in hydrostatics which confronts those species that regularly, sometimes daily, undergo great vertical migrations.

Deep-sea Fishes Get "Bends"

Among the many fishes freshly up from the depths which I examined during my Messina activities, only one species showed signs of the "bends": only a few species (those having swim bladders) showed exsceration, a floating an inability to accommodate to the diminished pressure of the surface.

Since there is no daylight in the depths, there are no photosynthetic organisms, such as algae or diatoms. Hence, all creatures there are predators, or scavengers living on carrion that continuously rains down from the upper sea layers. The fact that most inhabitants of great depths are relatively small may be related to the overwhelming competition for a limited food supply.

I recall a morning after one of our night-fishing ventures. In the laboratory my wife was going over the evening's catch, separating the dead from the living, identifying, sketching, and generally fulfilling her duties as junior ichthyologist to the expedition, when she let out a yelp. I came over and saw that her eyes were fixed on a tiny fish about an inch long. At first the creature looked like just another myctophid. Then I saw the cause of the yelp.

It was a species of *Myctophum* all right, and the body was sprinkled with the usual light organs, blue in this case. But on the fish's snout, lying close between the eyes, were two relatively enormous spots of phosphorescence that looked like the headlights of an automobile. They glowed a brilliant intense white. Furthermore, under the eyes there were also patches of highly luminescing tissue. "Myctophum headlights," my wife hastily latinized, exhibiting her newly acquired knowledge of fish taxonomy.

Signor Filiberto Mazza of the Institute's staff, who came into the laboratory a little later, supplied the correct identification—*Myctophum rafinesqui* (page 605). He seemed a little amused at our unsophisticated delight over the "headlight" structures. He stepped out of the room, returning in a few minutes with a museum jar in hand.

"Here in this even rarer *Myctophum metapelampax* you will see some real headlights."

There, pickled in formalin, were several specimens about three inches long whose entire foreheads were solid masses of light-producing tissue. The tissue, naturally, did not glow as in the case of our living specimen, but it showed the lengths to which Nature sometimes goes.

Signor Mazzi, incidentally, is a science artist of note. For years he has devoted himself to recording the extraordinary marine life of Messina's fabled strait. Sitting in his laboratory with one eye pressed to the tube of a microscope, he has transferred in enlarged detail every scale, every fin ray from fresh specimens to huge, precise drawings which line the walls of the Messina Marine Institute (page 597).

Exotic Sea Life by the Pailful

It was not until mid-February that we had our first promising sirocco. It began late one Saturday afternoon. The moon was right, and Giuseppe said that if the wind continued we'd find more specimens in one day than in the whole previous six weeks.

Sometime during the night the wind made a complete switch, and when I awakened Sunday morning I found it blowing smartly from the north. Nevertheless, I kept my appointment at the laboratory with Giuseppe, whom I found waiting there, disappointed and apologetic.

On my work bench he placed two big buckets full of squid, starfish, and a number of medusae I had never seen before, plus jars containing a dozen exotic deep-sea species, several unfamiliar to me.

"If the sirocco had only lasted a few hours longer," he kept saying, "then . . . molto materiale . . . molto, molto."

But I did not feel Giuseppe's disappointment; from my standpoint we had hit the jackpot.

The haul brought in that day contained a galaxy of ocean wonders. The awesome

Lost in the Eaten In the Law of the Abyss

Author and Wife Photograph Deep-sea Specimens in Messina's Marine Institute

[illegible]

[illegible]

[illegible] and *Stomias* [illegible]. The mysterious light organs of the myctophids, the weirdly colored [illegible] *[illegible]* [illegible] [illegible] [illegible] but also not to my [illegible].

The specimens of *Trachypterus* I had seen earlier were small, not more than [illegible] inches long, and were dead or at least [illegible] their [illegible]. [illegible] was a [illegible] for the photographs.

Like a Steam-rollered Eel

In my aquarium the silvery creature looked like a blunt-faced eel [illegible] with a [illegible] color. Running along [illegible] back was a delicate [illegible], the dorsal fin, that constantly and [illegible] undulated. When the fish was disturbed or in motion this [illegible] rippled with a grace beyond the power of words to describe.

One of the so-called ribbonfishes, my [illegible] sea serpent had a droll, down-[illegible] [illegible] [illegible] with [illegible], [illegible] a tail [illegible] [illegible].

I [illegible] [illegible] [illegible] [illegible]. [illegible]

[illegible] I [illegible] to the laboratory [illegible] [illegible] were with the other [illegible] [illegible] back.

I had [illegible] and comb jellies are [illegible] the world over. So I brought back no specimens to the laboratory. But I could not [illegible]

Cruising Japan's Inland Sea

Voyaging Among Green Islands and Tide Rips to Explore the Secluded Beauty of an Island World

By Willard Price

With Illustrations from Photographs by the Author

"I THINK—small boat—Inland Sea—very danger."

Captain Hikeda's English was not perfect, but his meaning was clear. He did not approve of our plan to sail a small boat from end to end of Japan's land-girt waters. Master of a vessel of 3,000 tons sailing the Inland Sea, he knew its labyrinth of islands, reefs, shoals, hidden rocks, savage tide rips, and whirlpools.

What had we let ourselves in for? When we first conceived the idea of a small-boat expedition the length of the Inland Sea, we knew its reputation as one of the most beautiful waterways in the world, but not that it was also considered by sailors to be dangerous in places for smaller craft.

On previous visits to Japan my wife Mary and I had seen the Inland Sea from the decks of large steamers. These brief glimpses were tantalizing. We wanted to loiter around its ravishingly beautiful islands, probe its bays, land on its warm beaches, walk through its villages tucked in snug coves between the sea and pine-clad mountains, and learn what sort of folk live in this secluded island world.

Voyagers Run a Gantlet of Noes

The way to do it was in a small boat, much as we had sailed the Nile, the Amazon, and China's Grand Canal.* But difficulties now arose that we had not encountered in previous ventures.

One was the hazard of raging tides that twice a day rush in and out of the Inland Sea, funneling furiously through narrow passages between islands, rocks, and reefs. The tides are no higher than elsewhere, but the many obstacles in their path make this a chaotic sea.

Another was the fact that the sort of thing we proposed was "not done." We were told upon arriving in Osaka, jumping-off place for the Inland Sea trip, that we would have trouble finding a small-boat owner who would rent his craft for such a foolish journey.

Inland Sea fishing boats rarely venture more than five miles from home port. Why should they? Fishing is as good near home as far away.

The Inland Sea is 250 miles long from Osaka at the eastern end to Moji at the western. It is sprinkled with islands estimated from 700 to 3,000, depending upon whether the term "islands" is extended to cover islets and the fantastic rocks that jut up sometimes a hundred feet from the blue surface. No other sea on earth, not even the Aegean, is so rich in islands. The circuitous route we had planned in and out among the islands would cover not merely 250 miles but something over 1,000. To boatmen used to fishing within sight of home port, such a proposition was absurd (map, page 622).

Japanese Craft Ignore Mines

The third difficulty, quite unanticipated, nearly wrecked our project. The Occupation was then in effect, and all Americans and other foreigners under its control were forbidden to travel the Inland Sea.

Mines sowed in the sea by Allied airmen during the war had not all been swept up. Occasionally one exploded and a boat went sky high; hence the ban. It did not apply to the Japanese. Their craft could, and did, steam at will over the sea. Most of them were wooden-hulled and of such shallow draft that they slid over any mines there.

Officials puzzled over our case, anxious not to obstruct our project. Finally they came up with a solution. Although we were in Japan on military permit, we did not belong to Occupation personnel. Therefore the Occupation authorities could not properly limit our movements. We were free to sail the sea and get blown up if we wished, provided we did it on our own responsibility.

So now we turned back to the problem of renting a boat. A new-found friend, Kunitsuna Sasaki, passenger traffic manager of the Kansai Steamship Company, came to our aid.

He journeyed with us by kansai steamer from Osaka to the fishing village of Sumoto on the island of Awaji, and there we found a craft suited to our purpose. The owner agreed to rent it and entered into a verbal contract on the spot. We returned to Osaka, drew up a written contract, and sent it to Sumoto for the boatman's signature.

But he had had time to think things over. The Cassandras of Sumoto had filled his ears with stories of wrecks in the far parts of the

* See, in the National Geographic Magazine: "My Journey Down the Nile," April, 1940; and "Grand Canal Pageantry," April, 1937, both by Willard Price.

Draped with Drying Nets, Japanese Fishing Boats Anchor in Kannoji Harbor

For their 6-week voyage on the Inland Sea, author Willard F[illegible] and [illegible] engaged the three [illegible] craft Kanagawa for the Japanese sea and supposed to protect sailors [illegible]

Inland Sea. His boat might be smashed on the [illegible] water [illegible] the shoreline [illegible] breaking the contract he [illegible] the boats then any disaster would be [illegible]

[illegible] to capture a Japanese fishing [illegible] we [illegible] Mr. [illegible] [illegible] months [illegible] Japanese land. [illegible] photographs, the [illegible] [illegible] "Wave-Swept Road Upon," with the [illegible] "Wave-Swept Road to Sail the Inland Sea." [illegible] were invited to write.

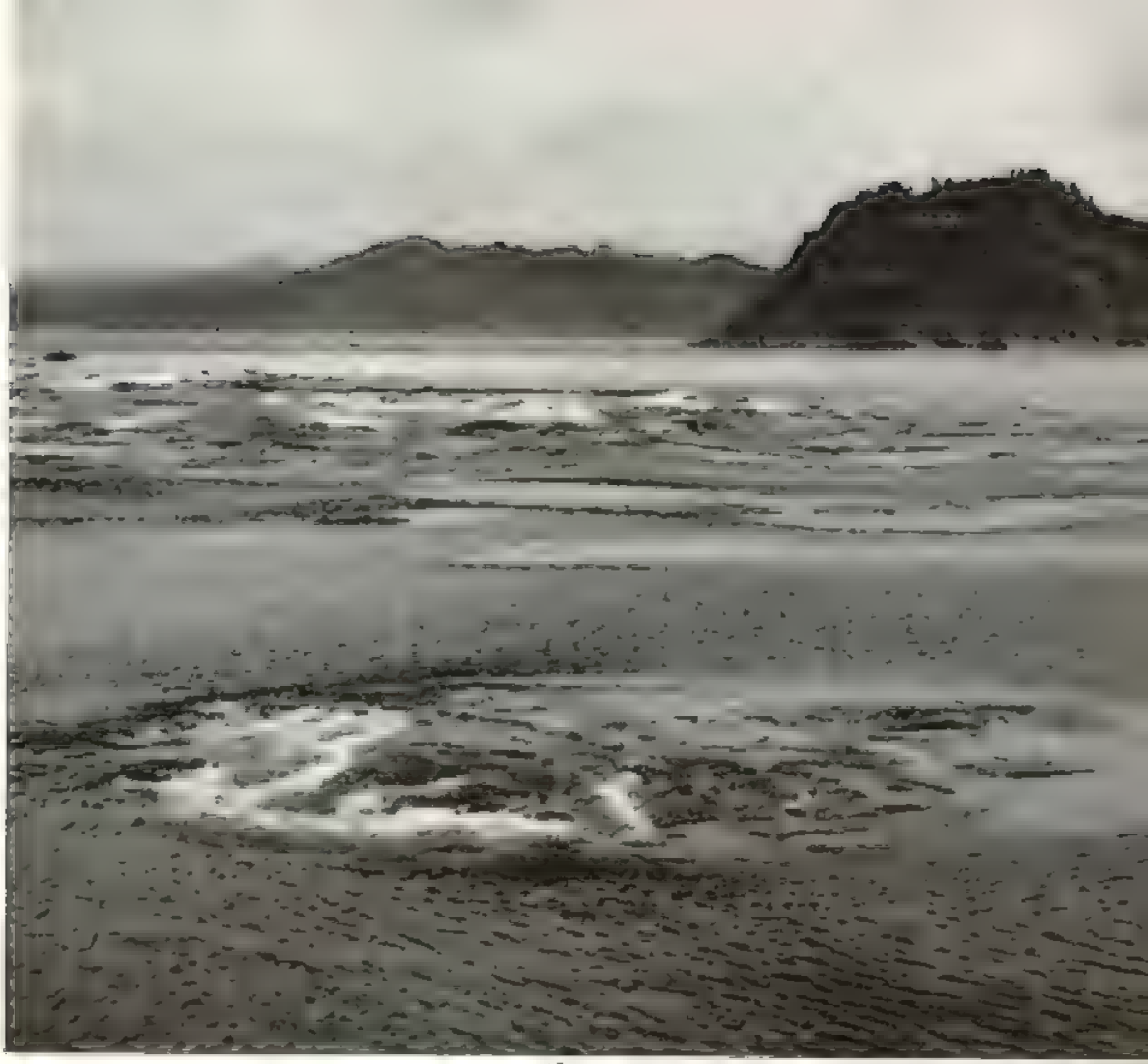
[illegible] of letters. But when [illegible] their sources and [illegible] were withdrawn.

[illegible] one. The letter came from Kannoji [illegible] a part [illegible] It [illegible] and then terror [illegible] the Inland Sea to sing ships and taking [illegible] [illegible] but the [illegible] Kannoji [illegible] are all of a pattern [illegible] much changed [illegible]

Wide-Margin-of-Safety Willing to Gamble

We journeyed to Kannoji and met the young man who had written the letter. His name, freely translated, means "Wide-Margin-of-Safety" [illegible] [illegible] plan [illegible]

[illegible]



Clashing Currents in Naruto Strait Stir Up Seething Whirlpools

Seasoned sailors of the Inland Sea steer clear of its [illegible] passage. [illegible]

of the Kummagai fleet lay at anchor. Draped with [illegible] the vessels looked like enormous bats. He pointed out one [illegible] about a hundred [illegible]. That was his. It could be [illegible] if we wished. [illegible] He [illegible] His two uncles [illegible] the crew. [illegible] could speak English. That was [illegible] years resident in Japan [illegible]

The boat [illegible] It was [illegible] with 10-foot beam. It carried two sails [illegible] It looked more like a schooner than any other Western [illegible] of the junk type with moderately high poop [illegible] stem [illegible] low [illegible] and [illegible]

Could I go aboard? A high sea was rolling into the roadstead, urged on by a smart wind. The captain grinned doubtfully, but [illegible]

When I [illegible] round. It was a [illegible] eight feet [illegible] Japan. [illegible] standing in the stern manipulating the sweep [illegible] distance of the stone [illegible] the mole.

I [illegible] the shell [illegible] The captain wagged the sweep and the [illegible] swerved from side to side [illegible]

both gunwales. Coming at last alongside the fishing boat, we did not scramble onto it but allowed a wave to throw us aboard.

Two towering masts divided the craft roughly into thirds. Aft of the mainmast were the engine and some cubbyholes for the crew. Beyond the foremast were the big rusty anchors and coils of line. Between masts was a good expanse of deck that we would have to ourselves. The captain explained that an awning would be erected to keep off the sun. There was a covered tub of fresh water, and we could cook on a charcoal brazier.

"But where do we sleep?"

A Fish Bin for a Stateroom

Cheerfully the captain removed a hatch and I looked down through the hole. What I saw was a compartment ordinarily used as a fish bin. It did not smell fishy—it had been scrubbed perfectly clean—but it was very shallow, not two feet deep. I looked at the captain unbelievingly.

He promptly tried to convince me that a human being could actually squeeze himself into this shallow space. He slipped through the hole, stretched his legs under the deck in one direction and his head and shoulders in the other and lay still, leaving me to contemplate his stomach, the only part of him still visible. With the hatch on, as it would be in stormy weather, the place would be as dark as a pocket, and airless.

Wide-Margin emerged grinning, expecting my approval. I nodded. After all, what quarters could one expect on a fishing junk? If the weather was not too cold or wet, we could sleep on deck.

"When the sea is rough, does it wash over the deck?" I asked.

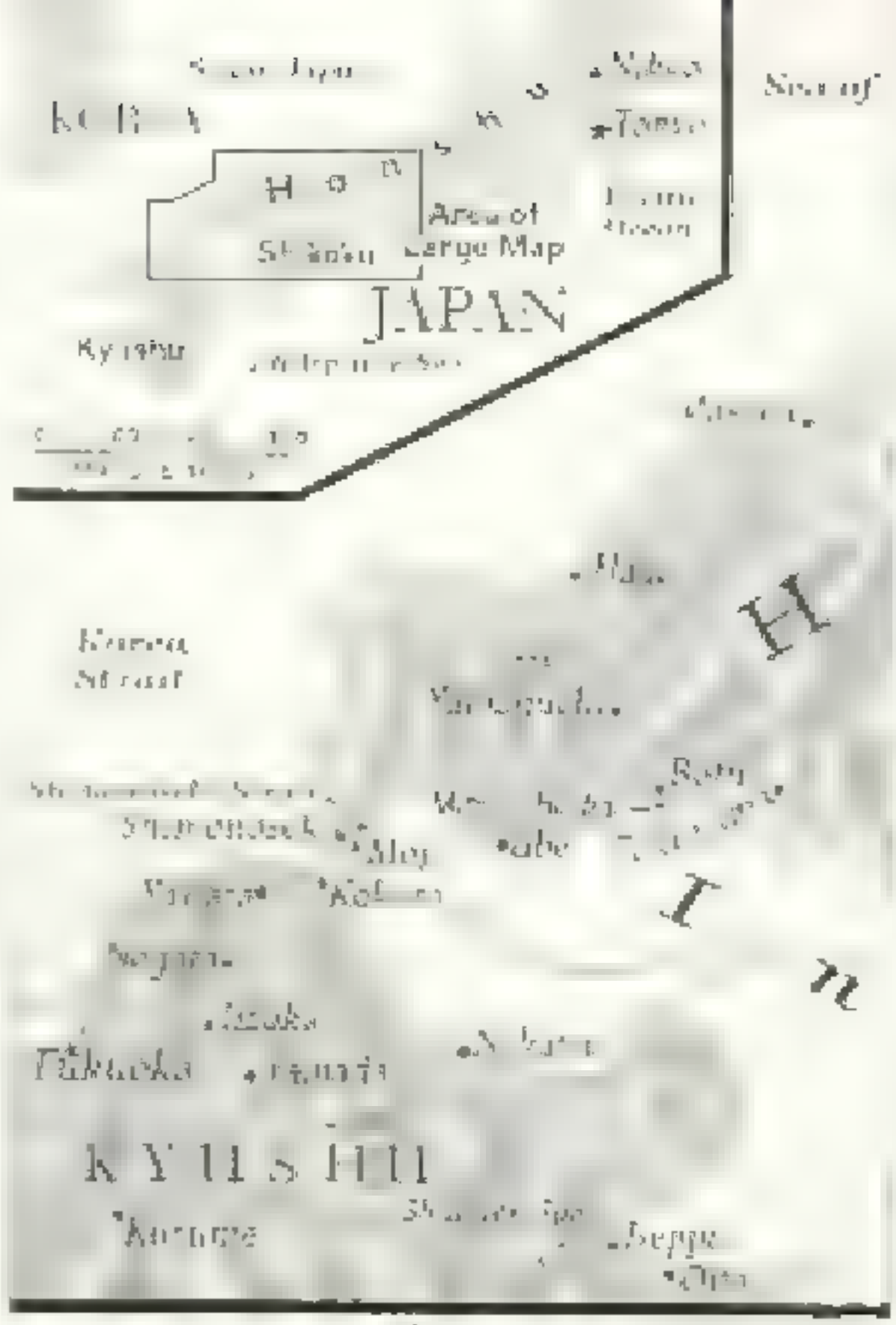
The captain laughed and nodded vigorously.

We took off in the dinghy for the mole, where my wife had been joined by several hundred citizens of Kannonji. The sea was more choppy than ever. Halfway to shore, Wide-Margin-of-Safety lost control of the treacherous little craft, which promptly turned turtle.

The overturned boat, tossed by the waves, struck me a blow that nearly knocked me senseless. I hit something else—the rudder of an anchored junk. Grabbing it, I pulled myself aboard and was taken ashore in another dinghy.

Our captain was all apologies. He assumed that our deal was off. A kindly fishwife insisted that we come to her house, remove our wet things, and don summer kimonos. She washed the salt out of our clothes and ironed them, refusing to take a penny for her pains. I was touched by her kindness, the more so when I learned that her son had been killed while fighting our troops in New Guinea.

In an upper room that looked out on the fishing fleet we sat on the matted floor and sipped hot tea. The captain was crestfallen. I assured him that all was not lost and told him our English proverb, "A bad beginning makes a good ending." Thereupon we drafted a contract for a 6-week voyage.



His charges were reasonable enough. For the boat and three men we would pay 2,500 yen a day ($7), with an additional charge for fuel. The men would buy their own food, and we would buy ours.

For us this was eminently satisfactory, and for the crew as well, since they would earn more for six weeks of pleasurable cruising than for a year of toilsome fishing.

We returned to Osaka in high spirits. It would take a few days for the men to construct the awning, build a convenience overhanging the stern, and put a floor in the fish-bin stateroom. Then they would bring the boat to Osaka, and our voyage would begin from there.

Sea God Carried for Luck

In the meantime we bought necessary equipment—heavy comforters for sleeping on deck, pots and pans, a few dishes, a little cutlery, and a Shinto shrine!

Fishermen facing the unpredictable are usually superstitious. The captain had, half in jest, remarked that my dunking in the sea on the first day was a bad omen. The shrine seemed to be the answer. We placed it on deck and dedicated it to Kompira, the Japanese sea god who is supposed to protect sailors.

280 Miles Long, Japan's Inland Sea Is 4 to 40 Miles Wide

[illegible] of islands and fighting furious currents, they varied the cruise with stops in friendly villages.

His sanctuary at Kotohira overlooking the Inland Sea attracts thousands of pilgrims, especially seafarers (page 641). We went one step further: we honored Konpira by naming our boat after him.

On a lovely September morning the little craft arrived at Osaka, took on her passengers, was duly photographed by newsmen—some of whom had come all the way from Tokyo for the event—and sailed away to the west with flags flying. We placed the statue at the foot of the foremast (page 627). It delighted the crew, who made offerings of fish and rice before it throughout the voyage.

Now we met for the first time the uncles of Wife Margin-of-Safety. One was "Good-[illegible]." Would his name prove [illegible] as the captain's? The other was [illegible]. It was true that he was a sixth son, but as for literature, he pursued it at a respectful distance. Both men wore towels around their heads, brigand fashion. With their brown faces twisted out of shape by a lifetime of squinting out to sea, and their mouths studded with teeth like those of a killer whale, they looked as if they could rob a galleon or slit a throat with equal ease. We were to learn that they were as gentle as lambs.

The wind was fair, and we sped toward Kobe without benefit of engine. The two big lugsails towered above us, the larger reaching to a height of 30 feet. In the best junk tradition, bamboo slats or battens kept them stretched to the wind, and other bamboo strips held them to the masts.

Much of the Inland Sea is remote and mysterious, but this part is like Main Street. It vies with Tokyo as the industrial and commercial heart of Japan.

Cities stretch continuously along the shore from Osaka, second largest metropolis in the nation, with 2,000,000 people, to the great port of Kobe, 20 miles away, with 810,000. We knew that beyond the hills only 28 miles away was million-big Kyoto, third largest of Japanese cities and for a thousand years the capital (page 646).

What a triumvirate are these cities—Osaka building industrial machines, Kyoto fashioning art objects, and Kobe helping to ship these products to all parts of the world. Osaka and Kobe were flattened by war; Kyoto was spared because of its temples and art. Now it would be hard to find in any of them the scars of conflict, except perhaps in the minds of men.

The chimneys of large shipbuilding yards belched a smoky welcome as we entered Kobe harbor and tied up at the American Pier. We were surprised and pleased to find waiting for us a group of officials who drove us around town, took us to the beautiful Mansion Kobe

C24 [illegible] Photograph by [illegible]

To Make Salt from the Inland Sea, Japanese Use Sand as a Blotter

[illegible] In the [illegible] which [illegible] to land

formerly [illegible] private home, now a hotel [illegible] to the Hotel Seigaso [illegible]

[illegible] we returned to the beer [illegible] to bed to the [illegible] bin. Exploring, [illegible] with a flashlight, I [illegible] a spider [illegible] that fled [illegible] wet [illegible] However, we counted ourselves fortunate to find no rats or mice.

When my head was on the pillow, my nose was just six inches from the deck above. [illegible] We [illegible] and went to [illegible] I was [illegible] through [illegible] smaller and smaller, until I was finally trapped. I came to with a start and bumped my head, only to hit the hard deck.

[illegible] you're leaving, you'd better use the [illegible] Mary advised [illegible]

[illegible] hot as Tophet [illegible] I complained

The captain had [illegible] would not too cold on deck. [illegible] Mrs. [illegible] warmers, we [illegible] on our bikes.

Navigation by Asking the Way

We [illegible] Kobe [illegible] the fishing village of [illegible] Awaji. We had [illegible] for emergencies, but we intended to live off the country for the [illegible]

But where was Iwaya? A [illegible] the hills of Kobe [illegible]

The captain and [illegible] were [illegible] an argument, [illegible] quite different directions. [illegible] fishing boat [illegible] in

In Wide, Wet Steps, Rice-growing Terraces Carve with the Hillside's Contour

[illegible]

[illegible] Wide-Mouthed-Society.

[illegible] Harada of Kyoto [illegible] there. [illegible]

[illegible]

The morning mist burned away before we reached Iwaya village. The sea was dotted with small boats in which the tentacles of octopuses waved, for this is a famous octopus-fishing ground (page 634).

The method of catching these 8-armed frights is curious. An earthenware pot is let down at the end of a cord, the other end being made fast to a small buoy. The octopus loves nothing so much as a dark hole and crawls into the pot. If the pot is drawn up gently, the tenant does not realize what is happening until it is too late.

Along the beach of Iwaya, octopuses stretched out by bamboo sticks to dry in the sun looked like kites. We passed them by, asking for food, and were referred back to the octopuses, the only breakfast the village could offer us.

Octopus Eyes No Food for the Queasy

We broiled sun-dried octopus over our charcoal brazier on the deck. The tentacles were not bad, once you forgot their similarity to snakes. The suction cups were as crunchy as nuts, but the body was as tough as rubber.

The eyes are supposed to be a great delicacy. They look much like human eyes, and after you swallow them you have the guilty feeling that they are continuing to look at you from the inside.

We sailed a glassy blue sea along the mountainous shore of Awaji to the sizable town of Sumoto. Here welcoming officials took us to see their most notable citizen, an eye-ear-nose-and-throat physician who in his spare time pursues one of Japan's most famous arts. Dr. Tatsuzo Matsutani is a father of Japanese puppetry. From bamboo and brocade, plaster and paper, he contrives puppets two-thirds life size. Made mobile by multiple controls, they do almost everything but talk (page 640). The remarkable Bunraku theater puppet shows in Osaka and other great cities have their inspiration in this island part.

So many things move in a complicated Matsutani puppet that one operator is not enough; it takes three or four. They are in full view on the stage, but their black clothing, covering face and body, is supposed to make them invisible. From the point of view of the Japanese spectator, they just aren't there.

Dr. Matsutani insisted that we stay to dinner, lodged us for the night in a room in his hospital, and sent us on our way with a good breakfast, all because "We are grateful for what Americans have done for us. Makasa was a *kamisama* to the Japanese."

"Makasa" is as close as the Japanese tongue can come to MacArthur, and "kamisama" means Me God, or Honorable Deity. Although General MacArthur had given way to General Ridgway, he seemed more firmly enshrined in the hearts of Japanese than he was when actually in Japan. When MacArthur left, a town official said, "We have lost our basement." He evidently meant foundation.

We stopped at the atoll-like harbor of Yura and also at primitive Nu Island where, in accordance with old custom, a crier was passing through the streets of the fishing village ringing a bell to announce a death. Then we sailed to the city of Tokushima on Shikoku. There three newspaper reporters, one of them a young woman, met us.

Newspaperwomen are rare in Japan, and the kimono it is one wore made her seem still more out of place. She looked on shyly as the men conducted their interview and, when urged to come forward, retreated so abruptly that she stumbled over an anchor and sat down hard on the deck. Now she was all blushing confusion and would have run away in utter disgrace. Mary gently detained her until she controlled her fit of tears, then gave her an exclusive story "from the woman's angle."

And so to bed on the deck, but not to sleep. A phonograph in a seamen's bar split the welkin with a badly scratched American record of "Silent Night, Holy Night." Whistles blew and stevedores shouted as steamers docked or put to sea. Back and forth along the mole above our ship paraded the policeman delegated to guard us. Not content with patrol duty, he came aboard periodically to wake us up and tell us what good care he was taking of us.

Whirlpools Threaten at Naruto

At Naruto Strait we had the first taste of the perils of the Inland Sea. Through this bottleneck the tide rushes from the Philippine Sea into the Inland Sea like a mountain torrent. It meets the ebb of the previous tide, and the conflicting waters make giant whirlpools that sometimes suck down large boats (page 621).

We were advised to circle Naruto Strait by the Ko Naruto (Child Naruto or Little Naruto), a safer passage. But what a pity it would be to miss one of the most dramatic phenomena of the Inland Sea!

At least we could have a look at it from the steamer which takes Japanese tourists to view the spectacle. But when we went aboard, her captain explained at length why he could not go near the whirlpools that day: the sea was too rough, the waves too big.

The ship did roll violently, and a Japan Travel Bureau man who went with us spent the trip on the salon floor. But when we reached the strait the waves miraculously disappeared, the captain changed both his mind

(Text continued on page 635)

Rocky Spires Rising from the Water Like Ruined Battlements Make a Labyrinth of the Inland Sea

Pilgrims and Pupils Visit Red Maples on a Sacred Island

[illegible]

Tide Engulfs Itsukushima Island's Torii: Symbolic Gateway to a Shinto Shrine

This [illegible]

Stone Lantern and Pine Trees Look Out Toward Kompira and Honsen's Mountains

012

Fierce Mask and Ancient Costumes Frighten Devils from Itsukushima Shrine

[illegible] piles, the shrine seems to float on the Inland Sea when tide rises. [illegible] guard on [illegible]

Guy Stevens Prodded Goodbyes as Kennedy Leaves Skull Island

[illegible]

Fred Tobe & Rest as Mrs. Price Rides a Bushe like Argo

[illegible]

An Open Door on the Sun Lake a Mesopotamian Quest

and his course, and we steamed into the channel.

It was an eerie sight. For a time the surface about us remained as smooth as glass. Then in a perfectly quiet spot a peculiar boiling began. The water humped itself up into a dome and started to whirl. Faster and faster it spun, a deep pit forming in the center. Then the updraft of a moment ago was replaced by a strong downdraft.

It was easy to imagine the fate of a small boat caught in the centripetal whirl. Some of the pools were 50 feet across, some much larger. Where the outer edge of the whirlpool encountered still water, waves rose sometimes as high as 30 feet.

Whirlpool Maws Yawn for Ships

When a whirlpool began to form dead ahead, our steamer promptly changed course. The edges of the whirling disks caught our bow, and at such moments the ship would not answer her helm but staggered to one side or the other at the mercy of the merry-go-rounds. We did not go through the strait but only skirted it, then returned to Naruto town.

A debate took place on the dock. Could *Kompira* sail the strait? Captain Wide-Margin-of-Safety, being an adventurous soul, was inclined to accept a wide margin of risk. Old tars on the water front were unanimous in warning him not to challenge the deadly Naruto. It wasn't just a matter of whirlpools, they said, there were devils under the channel. One of the most persistent of Japanese superstitions is the belief in *kappa*, evil mermen or water goblins who delight in drawing humans down to a watery grave.

The prophets of doom won. It was decided that next morning we would sail the safe passage. Much disappointed, we put up at an inn for the night.

A Salvage Master to the Rescue

There we met our good angel. Mr. Takehisa, owner of the hotel, is also a civil engineer engaged in the salvage of sunken ships. Having operated often in the turbulent waters of Naruto Strait, he knows the channel as few men do. Of course we could go through Naruto. He himself would pilot us.

Even with an able guide it was a dazzling experience. The tide tears through the mile-wide passage at from 8 to 10 knots, a speed greater than that of many river rapids. The pilot selected a time when the outcoming tide should have nearly spent itself. However, as we entered the strait, we seemed to be looking up a staircase. Mr. Takehisa told us that the water is often five feet higher at one end of the strait than at the other.

Powered only by the engine, we began to weave among the whirlpools. We were surrounded by holes and water hills. Carefully we avoided the pits, but allowed the hills to crash against the prow and drench us with spray. The surface rose before us in different levels like great steps. Some plateaus of water were higher than our deck.

The boat staggered like a drunken man as the whirling currents caught her, now on one bow, now on the other. Cross currents rushed in from unexpected angles. She heeled so far to port that everything on deck began to slide, and I, taking pictures, had to embrace a mast. Then as suddenly she lurched far over to starboard.

With all this frenzied movement it was odd to hear the pilot say, "We're not moving." Taking a sight across trees on shore, I could see that we were making no progress. The top speed of the engine was six miles an hour. Evidently a 6-mile-an-hour current was holding us stationary.

Uncle Good-Fortune ran up a sail. This was nearly our undoing. A whirl of water swung the ship broadside. With the current pressing one way against the hull, and the wind the opposite way against the sail, our lee rail sank deep under water. A few inches more, and the shallow-draft, keelless ship would certainly have capsized.

Uncle hastily pulled down the sail. We turned and fled ignominiously with the tide.

Narrow Escape from Becoming Salvage

When the tide changed, we tried again and got through. Once when our craft seemed certain to be hauled down by the kappa, I had the distressing thought that our pilot earned his living by salvaging sunken ships. Has he diabolically plotted to sink *Kompira* so he could raise her? If so, I thought, he calculated without our sea god, for we came through safe and drew in to a cove to put the pilot ashore. Then he proved his good intentions by refusing payment for his services.

"Any time you want to do it again," he said cheerfully, "let me know."

"Thank you," I said. "Once is enough."

Leaving behind Awaji, largest island in the Inland Sea and famed in legend as the first of the Japanese group to drop from the spear-point of the ancestral gods when the Japanese archipelago was divinely created, we sailed across stormy open water to another large island, Shodo. Here at the town of Tonoshio officials set a valuable precedent. Ignoring our protestations that the deck of *Kompira* made a comfortable bed they insisted we spend the night at the town's expense in a delightful seashore inn (page 633).

Thereafter our captain, upon arrival at a new port, would fill officials' ears with the

Relics of Hiroshima's Atomic Holocaust Interest an American Visitor

[illegible]

[illegible] the wonderful treatment we had been accorded in the [illegible] part. The cities of the [illegible] were not going to be [illegible]. The [illegible] would be requisitioned to take us [illegible] we would be lodged at the best inn, entertained at an official dinner lasting as long as three hours, and tucked in for the night.

The captain's notions of [illegible] plots were not altogether altruistic. He always managed to get himself invited as well [illegible] get there is a [illegible] and he would [illegible] to [illegible]. [illegible] and he was [illegible] partner [illegible] the [illegible] large cities of Japan there are many along both shores of the Inland Sea. But nearly every town, too, has a well-appointed inn.

We would remove our shoes in the vestibule, put on soft slippers, and be led through [illegible] with [illegible]. The [illegible] feature of the room was always the [illegible], or [illegible] hanging scroll and a [illegible]. Sometimes there were chairs but usually we sat on the floor. The [illegible] and [illegible]

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An American Freighter Unloads Baled Cotton for Japan's Textile Industry

[illegible] the United States [illegible] cotton [illegible] Japan [illegible] [illegible] Kobe

ned at a three-hour dinner. Meals were served in the room on an ankle-high table. There is no public dining room in a Japanese inn.

At bedtime the maid spreads out soft thick quilts [illegible] for East and Westerner—and supplies guests with a sack of [illegible] as a pillow.

The Japanese Bath, Luxury Unlimited

The crowning joy of the day is the hot bath, of water from the spring. The tub is sometimes as big as a swimming pool. A Japanese bath is the most nearly perfect human device on this planet since the baths of Caracalla of ancient Rome.

The gardens of these inns are often places of great charm, and beauty and nearly every town has its public park, quite unlike anything of the sort in Western lands. The Japanese garden [illegible] stone lanterns and bridges.

It tries to achieve the effect of cultivated wildness or careful carelessness. A woodland glade may be so naturally covered with moss that one never dreams that every inch of it was planted by hand. [illegible] through the years [illegible] Eastern [illegible] so straight [illegible] within a Japanese garden.

Nor are there beds of flowers in the Western sense. In fact, flowers are seldom seen except where they grow in seeming naturalness in the woods or on the edge of a stream.

One rarely finds a garden in Japan without water. It may be a large lake; it may be a small pool; it may be only a waterfall or brook; but water there should be to satisfy the Japanese love of beauty. About the water there are always rocks, for Japanese garden designers believe in them. Many rocks in the old gardens were donated by feudal lords.

Beyond Shodo we entered the Inland Sea National Park, which is made up of myriad islands of all shapes and sizes, but alike in one particular—they are all up and down. We did not see one flat island in our entire voyage. Some rise to a height of several thousand feet. Everywhere our hosts were determined to take us to the highest peak in the vicinity. We did more climbing in six weeks in Japan than in six years in California.

Japan crowds a population of 83,200,000 into a land the size of Montana, which has 590,000. So even the islands of the Inland Sea have a considerable population, and the island mountainsides are often cultivated to the very top.

We think of rice as Japan's staff of life. So it is on the mainland (page 625), but on the islands sweet potatoes and fish are the staples. Here sweet potato vines will cling to any slope.

Many an island is too abrupt and rugged to do anything with except perhaps crown with a temple. Many are just gaunt, towering rocks. Although several hundred thousand people live on the islands of the Inland Sea, scores of charming islets are uninhabited, enchanted spots with beaches and gnarled aged pines, ideal places to step ashore, broil fish over a campfire, have a picnic, and spend a night.

Sailing the Waters of Dreamland

The blueness of this enchanted world amazed us. The sky was a porcelain blue, the sea was an exquisite blue-green so clear that one could look down into it to great depths, and the boat seemed at times to be floating in air. The islands, especially in the morning, were wrapped in a soft blue haze.

The people of this dream world are not greatly affected by changes taking place on the mainland. Nevertheless, some major reforms have reached them.

The Occupation's land reform has broken up large holdings and enabled tenant serfs to buy land for the first time. However, they choose to ignore the new law which requires that a man's land, upon his death, shall be divided equally among his children. Even on the mainland the average farm is only about two and a half acres; on the islands it is much smaller. To divide it into several still smaller farms would mean that each heir would get only "a cat's forehead," to use the Japanese phrase. So the islanders stick to inheritance by the eldest son. The other sons must leave home and make a new life for themselves.

To the islanders, fishing is of top importance. It is equally important to Japan as a whole. Eighty-five percent of Japan's animal proteins come from fish. Japan leads the world in fisheries production. In 1949, a representative postwar year, Japan produced almost three million metric tons of fish, the United States 2.5 million, the U.S.S.R. 2 million, and the United Kingdom and Norway 1.1 million each.

Age of Sail Has Not Vanished

The motorized fishing boat is common, and yet the age of sail has not vanished on the Inland Sea. Near Tomo we counted 28 sails within view at one time.

But the Inland Sea has many other industries besides fishing. The city of Marugame makes fans. Imabari makes towels.

Nihama mines and refines copper. I was taken by tunnel two miles inside the mountain of the Besshi mine. It is like a skyscraper standing on its head; the floor at the top is called the first, while the newest and lowest level deep in the heart of the mountain is the twentieth. The mine contains many miles of tunnels, and they are being extended at the rate of four miles a year (page 645).

In an island world of fishing villages with humble houses it was astonishing to come upon a sample of architecture that out-Nikkos the great shrine of Nikko in color and splendor. It is the magnificent temple of Kojoji on the island of Ikuchi (page 642). The many sanctuaries are gay, almost giddy, brilliantly decked out in red, blue, white, silver, and gold. The temple, belonging to the Shinshu sect of Buddhism, has been 10 years a building and is not yet finished. It is so modern that it was recently upset by a strike of its priests.

To see a curious art of Shikoku, we journeyed overland to Kochi. Here is the place for raising *onagadori*, or so-called "long-tailed" fowls. I call it an art rather than an industry because a bird with tail coverts 20 feet long is not of great utilitarian value, nor

(Text continued on page 647)

Fourteen Feet of Feathers Drag the Sickle on Ground

Japanese warriors once wore spectacular feathers from *onagadori* cocks, and warriors adorned their lances with the plumes. A few breeders still raise the birds, keeping them in high, narrow cages or wrapping and coiling the feathers for protection. Tail coverts on this bird fall far short of the record, 24 feet

Sun-to Puppets Rise Almost as High as Their Creators

[illegible]

Golden Carp Leap for Bread Morsels

[illegible]

Buddhist Pilgrims Pray Kojiji People on the Island of Honshu. Westerners Rarely Visit This Idyllic Shrine

A Seagoing Freighter Takes Shape in a Mukai Island Yard

Japan [illegible] Shipyards and Lloyd's [illegible] that [illegible] at of World War [illegible] [illegible] [illegible] famous [illegible] between Japan and the United States. Japanese shipyards in 1952 were producing [illegible] approximately equal to the present tonnage.

Japan [illegible] ships [illegible] for [illegible] [illegible] [illegible] [illegible]

Here the dilapidated [illegible] [illegible] [illegible] [illegible] Shipyard on Mukai Island. Mukai is [illegible] Inland Sea [illegible] the [illegible]

Many of Japan's merchants [illegible] have [illegible] [illegible] sea.

[illegible] Japan [illegible] [illegible]

Beppo's Stone Devil Presides over a Steaming Hot Pool. Hot Mineral Underwater Showers Massage Rheumatic Muscles

Vacation Page Pear from Osaka Factories

[illegible]

Women's Page Art Takes More Time

[illegible]

is it intended to be. The breeders of such birds are artists. I found that the price of a fowl depends upon the length of the feathers, which are valued at about $2 a foot.

In olden times the feathers adorned tops of samurai lances in the processions of the feudal chiefs.

Only the cocks have long tail coverts; the hens are quite ordinary. The average growth of the tail is two and a half feet a year, and the longest tail on record measured 24 feet. The bird is kept in a tall, narrow box, its tail draped over a hanger, though on Kinshu Island it is sometimes coiled up and wrapped in cloth. Once in three days it is taken out for a 10-minute walk. [illegible] behind it, carrying the "train."

Strange Tales of the Inland Sea

Some of the most famous of Japan's legends have to do with the islands and bays of the Inland Sea. There is the story of Momotaro that every Japanese child knows. An elderly couple who longed to have a child one day opened a peach and out stepped a baby boy. They called him Momotaro, Peach Boy. We remembered his story when we landed on Megi Island (Onigashima), the Isle of Devils. For when Momotaro grew up to be a mighty warrior he came to this island and conquered all the devils.

We were told of an island called Contrary because legend has it that disobedient children were sent there. Even today mothers warn their children, "Be good, or I'll send you to [illegible] Island." [illegible] the newspapers reported that two families had gone to court, each claiming to own Contrary Island because an ancestor had been sent there for being a bad boy. Another island in the Inland Sea goes by the name of All-the-Saints-Give-Drunk (Sensai).

In one of the deepest spots of the Inland Sea we looked down to what legend glamorizes as the sea king's palace. It looks like a palace, although it is nothing but an immense rock with many openings through which swim colored fish. It plays a part in the famous story of Urashima, the Japanese Rip Van Winkle.

Urashima, a fisher boy, was borne on the back of a friendly tortoise down to the palace of the sea king. There he met the king's daughter, married her, and lived with her for three dreamlike years. Then he longed to visit his native village. His princess gave him a jewel case as a remembrance of their love, but told him not to open it.

Returning to his village, he found everything changed. The houses were different, the people were strangers. Perplexed, he thought of his jewel case, the only friendly thing he had. He opened it and a cloud of purple smoke came out. His black hair turned white, his youthful limbs withered, and he crumbled to dust on the beach—for three years in the sea king's palace were equal to 300 on land!

Competing for honors with the king of the sea bottom was our sea god, Konpira, to whose shrine we climbed by 800 exhausting steps up the mount of Kotohira on Shikoku. Thousands of pilgrims, mostly grateful seamen, come here every year. One of the buildings of the temple is filled with models of ships supposed to have been saved from disaster by the friendly intervention of this god. Also there are numerous ships' shrines, and after our trip was finished Wide-Margin-of-Safety made a special pilgrimage to place our *Konpira* shrine among them.

Day by day and week after week we plied back and forth through fairyland, crossing and recrossing from one mainland shore to the other and circumnavigating the islands. We wished it would never end, except that at times a diet of raw fish, seaweed, bean curd, squid, tea, and rice becomes a little tiresome. After Naruto we touched at many places and passed through the strait of many wrecks, Kurushima. Its whirlpools reminded us dramatically of Edgar Allan Poe's description of the Maelstrom. Now the islands grew immense, a single bay of one of them looking as large as New York Harbor.

At the old naval base of Kure the famous battleship *Haruna*, reported sunk in the South Pacific but finally sent to the bottom in her home port, had been salvaged and was being dismantled for scrap iron.

Hiroshima Rises from Its Bombing

In Hiroshima (page 656) the mayor showed us the Industrial Exhibition Hall that is being preserved in its wrecked state as a memorial of the world's first atom bomb attack; then he took us to the roof of the City Hall to see how remarkably his city has been rebuilt. Even its ancient castle has been restored, although the new one is a temporary wood-and-plaster replica erected as a feature of a sports fair in 1951. From a distance it looks very much like the real thing.

Incidentally, there are many real castles left about the Inland Sea dating from feudal times. Fortunately they came through the war unscathed. Among the most picturesque are those of Osaka, Himeji, Samoto, Marugame, and Matsuyama. They contrast with their modern settings, in which the only visible reminder of former times is an occasional Kimono.

Though in westernized Tokyo the kimono has almost disappeared, it persists in and about the Inland Sea. There the women

A Tunnel Beneath Shimonoseki Strait Links Honshu and Kyushu Islands

[illegible]

[illegible] and turn out in numbers [illegible]

But in the home women [illegible] special role and wear the kimono, [illegible] American woman's entire outfit. Most [illegible] expensive, in fact, that most [illegible] they use their mother's [illegible]

We [illegible] to the island of [illegible] Miyajima, which the Japanese [illegible] most beautiful spots in Japan. [illegible] lucky enough [illegible] and been [illegible]

A [illegible] of the [illegible] [illegible] by the Mikado [illegible] resided [illegible]

Kamikaze Crashes a Mast

[illegible] a shower of [illegible] on the deck. [illegible] mast [illegible] and seemed about to break in two. The [illegible] stay from the peak of the mast to the bowsprit [illegible] and whipped about, lashing [illegible]

[illegible] gay on a sacred [illegible] costumed temple [illegible]

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Tokugawa Tuses Cure of Blindness

[illegible]

[illegible] even birth [illegible] Chosen [illegible] Kuth was the worst typhoon [illegible] It blew the Inland Sea into so [illegible] houses were found in Kamizaki [illegible] streets of houses [illegible]

Chased by "Typhoon Ruth"

Although this was the season [illegible] typhoons [illegible] had been [illegible] the edges of [illegible] Now however as we sailed [illegible] [illegible] We finally reached Hokkaido [illegible] typhoon Ruth [illegible]

Now [illegible] have been identified Pacific [illegible]

[illegible]

[illegible] Ruth [illegible]

[illegible] that [illegible]

[illegible]

[illegible]

Up to Their Necks in Hot Sand, Patients Take the Cure at Beppu

[illegible]

[illegible] purposes, every house has its own private hot bath. Large greenhouses [illegible] vegetable out of season. [illegible] part of Japan's [illegible] Black Forest. [illegible]

Buddha of Concrete and Bones

Other days we rolled up [illegible] the crystal-clear sea to the Great Buddha. [illegible] Japanese [illegible] bones and bones, [illegible] of Japan's [illegible] Buddhas were worked out in [illegible] concrete. The Buddha [illegible] and the largest [illegible] Japan, was built in 1924 [illegible] the bones and relics of a million people who died without relatives.

Another long [illegible] we stopped at the head of Mizairi. There [illegible] all [illegible] Above the [illegible] of Mizairi [illegible] the [illegible] we walked to hide in [illegible] Shimoseki [illegible] space [illegible]

We passed through the [illegible] the sea, [illegible] the [illegible] Hydroplane. There Sailor Dan [illegible] to navigate in the Inland Sea. We [illegible] with the [illegible] in Moji's little [illegible]

By [illegible] we climbed [illegible] to [illegible] the Inland Sea. [illegible] gradually curved [illegible] [illegible] and [illegible] for people and [illegible] [illegible] as [illegible]

We came down to stand on the deck of Kongo [illegible] Tomorrow we would take the train while our companions [illegible] back to Kobe.

Before [illegible] we shaved [illegible] and [illegible] for [illegible] we had [illegible] Wide-Mouthed Saucer. [illegible]

Mount Vernon Lives On

A Century of Patriotic Labor Has Restored George Washington's Old Home as He and Martha Knew It

By Lonnelle Aikman

THE Presidential yacht *Williamsburg*, trim and shining, rounded a curve in the Potomac and slowed down off Mount Vernon.

By her starboard rail stood a little group of President Eisenhower's special guests for the day's cruise—a busload of wounded and ill veterans from military hospitals around the Nation's Capital.

One of them, Pvt. Tommy Jones, his right hand swathed in bandages, stood by uncertainly.

"Sure, it's okay to use your left hand," called someone.

So Tommy Jones, too, saluted George Washington's old home, looking solemnly toward the stately white-columned mansion on the Virginia bluff high above the river.

It was the first time he'd saluted, he told us, since that grenade hit back in Korea.

Navy Tribute Is Regulation

The *Williamsburg* incident symbolizes the affection and reverence that Americans everywhere feel for Mount Vernon.

All passing U. S. Navy ships pay their respects to Washington's memory. By regulation, colors are half-masted, taps are sounded, and men salute (page 687).

The tribute goes back at least to 1801, when a newly commissioned man-of-war fired a 13-gun mourning salute opposite the Late General's home.

Gradually such spontaneous gestures became custom. The tradition was finally standardized, in 1906 President Theodore Roosevelt made it official.

But Mount Vernon is not just a national symbol, a historic monument to commemorate the remote deeds of a successful general and President. Its appeal is to the human heart, as the home of George and Martha Washington.

It was in April, 1759, that young Washington introduced this Virginia plantation to his bride, the wealthy and lately widowed Martha Dandridge Custis. With them came her two small children, "Jacky" and "Patsy" Custis, who already had won a lasting place in their stepfather's affections.

"You must have the House very well cleaned," George Washington (then colonel) wrote ahead to his Mount Vernon manager. "and Were you to make Fires in the Rooms below it wd Air them. You must get two of the best Bedsteads put up . . . Enquire abt. in the neighbourhood, and get some Eggs and Chickens, and prepare in the best manner you can . . ."

The house to which Washington brought his Martha was far from the impressive mansion that it would eventually become. It included then only the central portion of the building we now see. There was no sweeping riverside veranda, with its eight tall pillars. Service outbuildings and quarters were small and few, gardens and grounds were limited.

True, the 27-year-old bridegroom had made certain improvements in the cottage he had acquired five years before from his elder half brother, Lawrence Washington. He had added another story and a new roof. The foundations were strengthened, rooms renovated and redecorated.

Almost the only thing unchanged about Mount Vernon was the name that Lawrence had given it for an admired former commander, Admiral Edward Vernon.

Best of all was the property's location. "No estate in United America is more pleasantly situated than this," George Washington once described it. "It lyes in a high, dry and healthy Country . . . on one of the finest Rivers in the world."

Here Washington planned a lifetime career as a Virginia planter. Behind him, in that honeymoon spring, lay the adventures of the British frontier campaigns against the French and Indians. He had achieved military distinction and had recently been elected to the Virginia House of Burgesses.

"I am now I believe fixed as to a Seat with an agreable Consort for Life," he wrote to a friend.

Heartstone of Washington's Life

Though "fixed" was hardly the word, Mount Vernon remained the heartstone of Washington's life for the next 40 years, the place to which he hurried back after the Revolution was won and the eight long years of the Presidency served.

"I can truly say," he confessed as President in 1790, "I had rather be at Mount Vernon with a friend or two about me than to be attended at the Seat of Government by the Officers of state and the Representatives of every Power in Europe."

Today Washington's beloved estate lives on as a restoration that has been built up, bit

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Missouri and Overseas Forces Mount Vernon as the General Leaves It

Tuning Cars His Passe-vous à Tuning Park with the Nation's Scenic Pitts

[illegible]

by bit, by an organization called the Mount Vernon Ladies' Association of the Union.

This patriotic society, America's oldest to be founded by women, had its beginning 100 years ago in a drive to buy and preserve Mount Vernon as a national shrine.

So thorough has been the job and so modest are "the Ladies," as they are respectfully referred to by their staff, that many visitors think the memorial is maintained by the Federal Government.

One moonlit summer night I was the association's house guest at its unobtrusive headquarters built in the shadow of the "great house."

My room, with fancy American furniture and George Washington's picture on the wall, shared the gracious time spirit. As I looked out over the ghostly, moon-touched grounds, I could almost see the tall figure of Washington striding along on an evening walk.

Suddenly I *did* see it! Only it turned out to be one of the guards making his regular rounds.

Million Visitors a Year

Last year more than a million people visited Mount Vernon.

They sailed in by bus and car over the scenic 15-mile drive from the Capital, or, choosing the summer boat trip down the Potomac, tied up by shiploads at the site of the old Washington wharf.

A cross section of the American people, the callers bring interests that range from a scholarly quest for some little-known phase of George Washington's life to a folksy desire to see his false teeth.

Actually there is no denture exhibit. But staff officers say it is hard to convince inquirers of that fact, especially when they imagine they've seen it here in the museum's collection of Washington relics.

I heard of another slightly mixed-up tourist who stopped a guard on the path leading to Washington's tomb and sarcophagus. Would he direct her, please, to the "esophagus."

Such incidents are rare, however. It's more likely that someone whose hobby is 18th-century snuffboxes or gardens can tell even trained personnel something they didn't know.

"I'm still learning," said Charles C. Wall, resident superintendent at Mount Vernon, who has devoted 24 years to its never-ending tasks. "Our object is to re-create a true domestic scene. Each new detail brings us closer to Washington, the human being."

As a NATIONAL GEOGRAPHIC writer I joined the perpetually moving lines of visitors. Once I trailed along with a queen (page 678).

From the formal west-front doorway of the family house we looked out, as Washington did, on an oval courtyard where the original sundial is back in place.

Beyond, along shade-dappled lanes, stretched a series of small white cottages such as served the everyday needs of long ago.

Washington's plantation was a self-sufficient unit. "It's astonishing what a number of small Houses the General has . . . for his Carpenters, Joiners, Brewers, Bakers," wrote a 1785 guest, Robert Hunter, whose diary is preserved in the Huntington Library, San Marino, California.

Present day callers peer curiously at old-fashioned looms, reels, and wheels in the [illegible] Last year, Washington's workers turned out more than a thousand yards of woven cloth.

Near by is the storehouse, keeper of the plantation's simple necessities—nails, paints, leather, garden tools, and seeds.

Stage-prop hams hang high in the old smokehouse. Wooden tubs in the washhouse are ready for hot, sudsy water to scrub working clothes. And in the coach house stands an 18th-century carriage whose renewed gilt-and-maroon magnificence is a sure attention-catcher for passing small fry.

Wandering housekeepers look in vain for a kitchen in the family dwelling. They find it in an annex at the end of an open arcade.

I came on two women there staring, fascinated, at rows of pewter warming plates, iron pots, and skillets grouped around a cooking fireplace big enough to hold a bed.

"But wouldn't everything be stone cold," muttered one, "by the time it got up to the house?"

"Not if they moved fast," her companion countered. "And think how *good*, with all that country flavor left in!"

Old-time Country Living Lavish

There is a hint of country lavishness in a faded recipe for a "Grate cake" on view in the museum. "Wrote by Martha Custis for her Grandmama," it starts out. "Take 40 eggs . . . work four pounds of butter."

Washington kept his own dairy cattle and chickens, and produced vegetables, fruits, honey, and herbs in his kitchen garden.* He used what he needed and sent the rest, plus home-milled flour and the big wheat and tobacco crops from his outlying farms, to markets as near as Alexandria and as far away as England and the West Indies.

You can still see both kitchen and flower gardens alive and flourishing at Mount Vernon. With their typical 18th-century 'pease, lettuce, and beans, their bright beds of fox

* See "Home of the First Farmer of America," by Worth E. Shoults, NATIONAL GEOGRAPHIC MAGAZINE, May, 1958.

Here Washington Lived from Mount Vernon's Veranda He Watched the Potomac

The Excursion Boat Comes In. Sight-seers Head for George and Martha Washington's House

Mount Vernon: Still Belonging to a Member of the Washington Family When This Lithograph Appeared in 1840

With Washington [illegible] the [illegible] Mount Vernon [illegible] 657

Visitors View the Broad Potomac from the Portico Where Martha and George Washington Entertained Guests

Houdon's Bust Is Considered Washington's Best Likeness

[illegible] started the [illegible] Washington [illegible] Mount Vernon [illegible]

plowe, [illegible] among the [illegible]

There are original plantings of boxwood in the formal patterns Washington [illegible] and pear trees grow again. Trained against wall trellises or running horizontally along low fences, they are examples of the carbon-[illegible] [illegible] Lessons [illegible]

Washington's Trees Still Survive

[illegible] Mr. Wall [illegible] on the landscape [illegible]

[illegible] "[illegible] Washington." he replied. "We have [illegible] trees on these for protection but who [illegible] on them [illegible] the land was [illegible]

[illegible] Mount Vernon [illegible] Martha Washington [illegible] long [illegible] Washington [illegible] the Nation as well as of the man [illegible]

[illegible] fruitful [illegible] and military matters, the [illegible] general of the [illegible] turned to the [illegible] problems of [illegible]

[illegible] addressed to [illegible] the national Republic during the difficult postwar years urged national unity against the [illegible] confusions of the separate States. They helped pave the way for the Constitutional Convention of 1787 and a little later for Washington's own unanimous election to the Presidency.

Still another feature Washington counted a quite and courtly host [illegible] hints his spacious Banquet Hall.

Joshua Brookes, a young Englishman entertained there in 1799, described the room [illegible] furnished [illegible] chairs with yellow [illegible] white hunting [illegible] [illegible] with deep festoons of green satin.

It could be the description by a visitor of today. [illegible] in the home [illegible] ranging from the educational to the [illegible]

[illegible] elaborately carved mantle [illegible] Banquet Hall [illegible] It came to Mount Vernon in 1785 through the courtesy of a private [illegible]

[illegible] Washington [illegible] Lafayette [illegible] Washington [illegible] Mount Vernon [illegible]

[illegible] Washington [illegible] addressee, for some unknown reason, and [illegible] [illegible] Mount Vernon [illegible]

Of Keys and Music

[illegible] the man [illegible] help you with your history [illegible] the broad central hall of the mansion.

An attendant was pointing out a huge [illegible] enclosed key hanging on the wall [illegible] the main portal of La [illegible] sent it to Wash

The Mount Vernon Ladies' Association Presents Its Centennial Exhibit

[illegible] Art Dance Curriculum, a [illegible] Guild [illegible] to make the Washington home [illegible] purposes contain historic [illegible] pertaining to Mount Vernon and the association

[illegible] after the old prison fortress was destroyed during the French Revolution (page [illegible]).

"Over there" — the speaker waved toward a table miniature — "is a model of the Bastille made from [illegible]. People think [illegible] It was really [illegible] of a little-known [illegible]

From the hall we looked into the museum room where the [illegible] Washington loved to dance [illegible] neither sing nor [illegible] a single note on any [illegible]

Relic Restored After 85 Years

[illegible] as if [illegible] the [illegible] presented [illegible] Washington to [illegible]

[illegible] Mrs. [illegible] piped from Europe [illegible] Mount Vernon. Included [illegible] Mrs. Washington's greatest treasures [illegible] Mount Vernon. [illegible] and [illegible] and [illegible] and [illegible] and [illegible] returned it. It was the first piece of original furniture to come back.

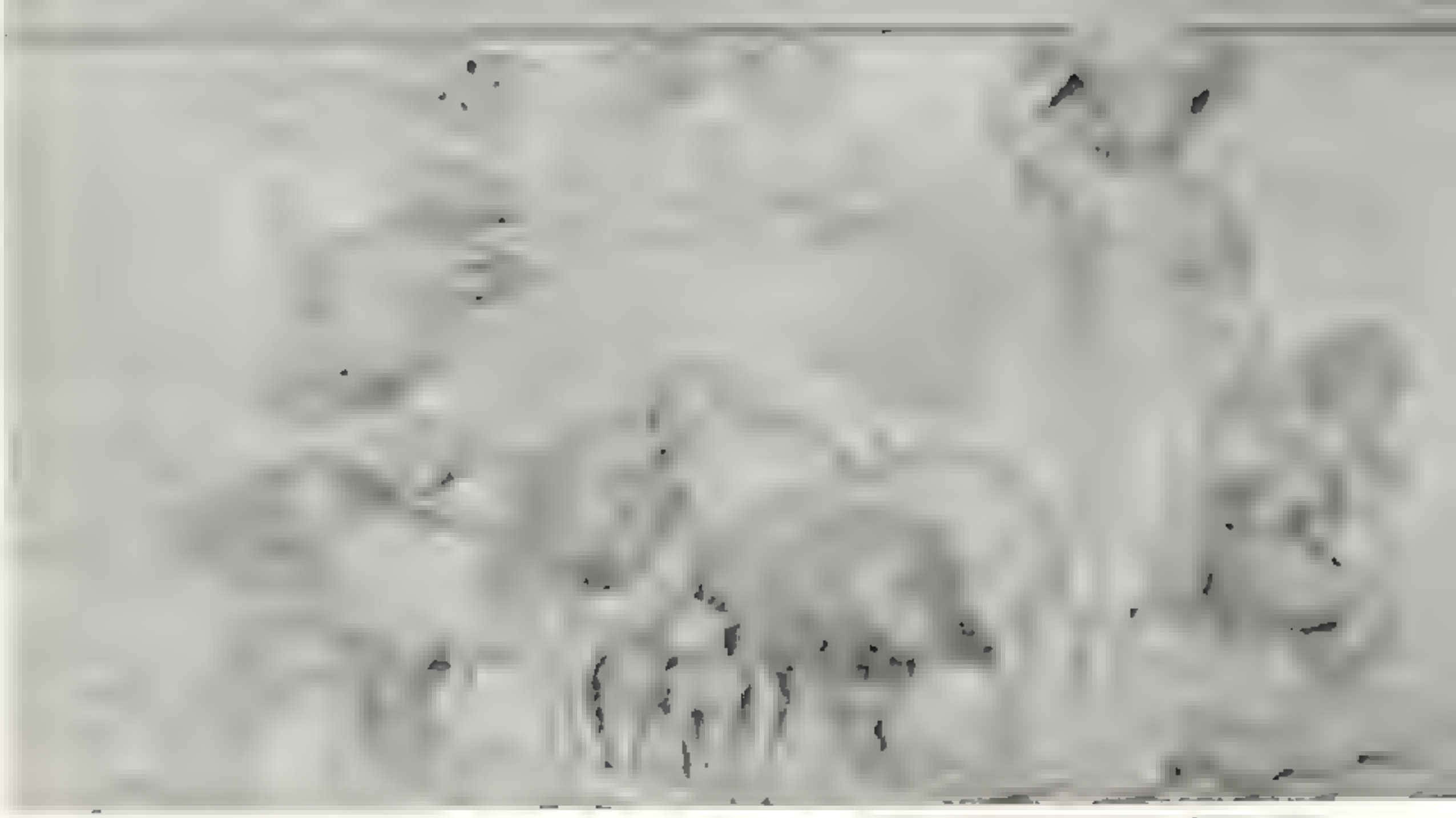
A strange [illegible] maker's name [illegible] the child [illegible] the name [illegible] gave it to [illegible]

[illegible] we walked around the charming [illegible] old house. [illegible] and other articles.

[illegible] was easy to imagine a [illegible] the old high chair [illegible] Mills and George W. [illegible] Parke [illegible] Martha's grandchildren. They were adopted and brought to Mount Vernon after the death of their father [illegible]

[illegible] with its [illegible] Mrs. Washington's [illegible]

An English Friend Sent This Marble Mantel to Washington for His Banquet Hall



An Exquisite Detail from the Banquet Hall's Carved Marble Mantel

The mantel (opposite) reached Mount Vernon in 1785 as the Banquet Hall was being completed. Antonio Canova was the sculptor. The classic broken head (right) was stolen by a soldier but later recovered.

"The General absolutely insisted upon our staying," a London traveler of 1785 wrote in his journal. "I could not refuse the pressing & kind invitation."

As Washington's fame grew, the flood of distinguished visitors increased, along with the admiring or merely curious uninvited. "A well resorted tavern," the master once called his house.

The guests were entertained informally in the painted west parlor, a room which in restoration holds an air of cheerful hospitality. Its molded ceiling, in 18th century Adam style, and the carved Washington coat of arms over the mantel give touches of period elegance.

Here are family portraits—the companion pictures of George and Martha painted by Edward Savage in 1796, and an earlier study by Charles Wilson Peale showing Washington handsome and debonair as Continental commander in chief.

Looking at the set up tea tray and the game table with its scattered playing cards and odd fish-shaped chips, one half expects the room to fill up suddenly with men in queues and small clothes. Or to see Martha Washington pass by in bouffant skirts and frilled cap.

Old Letters Clue to Furnishings

At bedtime many of Washington's guests had the honor, as one later reported, of being lighted to their rooms by the General himself.

There were six bedrooms on the second floor. These have now been refurnished in the period, with the aid of hints found in old letters and other sources of information.

As today's long lines of tourists file by they admire the handsome Lafayette bedroom, noted for its most famous occupant. They "oohed" and "ahed" over the juvenile bed in the little room by the stairs where children and grandchildren slept.

Then they stop to stare in surprise at a cage in the Yellow Room holding a stuffed bird!

It's a cardinal, prepared for Mount Vernon by the Smithsonian Institution in Washington, D. C. Such caged birds often were kept in 18th-century homes. Washington's records tell of his buying a parrot for Patsy, probably from the captain of a passing West Indies trader.

Always Children Here

I was curious about the white-canopied cribs in the Nelly Custis Room, for Nelly was beyond babyhood when she came here.

The crib, I learned, was for Nelly's little girl. The marriage between Nelly Custis and Lawrence Lewis, George Washington's nephew, took place at Mount Vernon in 1799 on the General's last birthday. Their child was born in this house less than three weeks before Washington's death.

In happiness or tragedy, there were always children around George and Martha Washington, though they were disappointed in having none of their own.

In the Blue Bedroom, so called from the painted woodwork, I knelt to read a faded letter pasted in the top of a small wooden trunk.

It was dated 1830 and signed by another of Martha Washington's granddaughters, Fanny

From Bed to Tomb, Mount Vernon Gives Painstaking Details of Washington's Life as a Private Citizen

1965 Nuzum Bergman Chesapeake from E. Fletcher

A Guard with His Ember-eyed Dogs Checks the Mansion

[illegible] A high wall surrounds the estate (page 676)

Parke Custis Law. Just Mrs. Law, then herself a grandmother, recalls the trunk's past.

"It was that in which the [illegible] of my Samuel Grant [illegible] would be [illegible] when she went [illegible] the General, whenever the Army were [illegible] fers. I have stood by it [illegible] with distress at [illegible] away & oh how [illegible] when she returned did I [illegible] to see her [illegible] & the many gifts she always brought for her grandchildren."

Most Prized Article

But the most prized article that has come down to Mount Vernon [illegible] mahogany bed in [illegible] Martha Washington [illegible] in which the [illegible]

Washington [illegible] exposure to snow, sleet and rain as he went about his usual outdoor activities. He last [illegible] grave, [illegible]

He [illegible] these creatures were [illegible] from [illegible] Washington [illegible]

[illegible]

[illegible] Vernon [illegible] Washington to Dr. Dick, who [illegible] Washington [illegible] fraternal [illegible] Washington Masonic Lodge No. [illegible] It is now [illegible] Washington Masonic National Memorial in Alexandria.

After Washington [illegible] Martha [illegible] room [illegible] door [illegible] could see the [illegible]

[illegible] of this [illegible] today, [illegible] looked out toward the tomb

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Visitors Strolling Down South Lane Pass the Reconstructed Coach House

[illegible] Mount Vernon [illegible]

In fancy I could picture again the [illegible] procession [illegible] the [illegible] [illegible].

The [illegible] in 1831 the bodies of George and Martha Washington, together with those of other members of the family, were removed to the new vault, built in accordance with the [illegible] provisions in Washington's will.

Visiting Celebrities Make News

The [illegible] wreaths [illegible] organization [illegible] The Veterans of Foreign Wars alone in 1953 had [illegible] at the tomb.

Most of the visitors to the Washington tomb are plain Americans [illegible].

But royalty and other newsworthy visitors [illegible] photographers and State Department [illegible] pay their respects and leave a wreath on the tomb.

[illegible] Mount Vernon to honor the rebel Washington. The visitor was [illegible] November [illegible].

A few months later I was privileged to see the official visit of Queen Juliana of the Netherlands and her husband, Prince Bernhard [illegible].

For Juliana this was [illegible] Washington.

Now the [illegible] the house [illegible] white [illegible] Washington's garden.

To walk through the gates of Mount Vernon [illegible] King [illegible] Queen Elizabeth of Belgium [illegible] Queen Marie of Rumania [illegible] the past.

Spits and Cranes, Pewter Warming Plates, Corn-grinding Mortar, and Bellows Were Part of 18th-century Fireplace Cookery

[illegible]

"Here's the top of the book," said a staff official, as I turned to a double page spread for January 1, 1942. On opposite sides were "Franklin D. Roosevelt" and "Winston S. Churchill" written the same day they signed the first United Nations declaration.

Beginning with James Buchanan, virtually every U. S. President has paid a call at Mount Vernon. Some have come often. On one trip Theodore Roosevelt and party rode up on horseback through a driving rain.

Just before the Civil War broke, a newspaperman stem to the Washington *Evening Star* noted that a prominent Washington resident had sailed down to Washington's old home by the steamer *Thomas Collyer*. It was Mrs. Abraham Lincoln.

Library Collection Is a Gold Mine

Digging into Mount Vernon's past, historians and biographers find the association's reference library a mine of information.

In its quiet, sechoed rooms at headquarters George Washington's daily activities are referred to as if they happened yesterday. "I wish," murmured gentle Miss Irene Warren, the librarian, "that I could have helped him sort his papers. He kept a record of just about everything and it must have been a terrible job."

Among the priceless items preserved in the archives are dozens of Washington's handwritten letters, his manuscript diary for 1747, and a little cash-account book he carried around with him. There are even a number of Martha's original communications, far rarer than those of her husband.

One large collection of letters, written during the Revolution, reveals the day-by-day steps through which the modest family house at Mount Vernon was finally expanded to "mansion" size.

This correspondence, including instructions and reports on wines being asked for the library and banquet Hall, was between the General in the field and his distant relative and estate manager, Lund Washington.

Washington as Architect

Even during the anxious period following the fall of New York City in 1776, the Commander in Chief wrote Lund Washington just what he expected of his new Banquet Hall:

"The chimney of the new room should be exactly in the middle of it," he directed, "the doors and every thing else to be exactly answerable and uniform. . . . In short I would have the whole executed in a masterly manner."

Confidence in Mount Vernon's future (and its country's) could hardly go further.

The finishing touches to the estate came after the war. The bowling green was added in 1785. Next year the high colonnaded porch was completed with flooring stones imported from England. The crowning ornament for the house, the weather vane in the shape of a dove of peace, was placed on the mansion in 1787.

For all these and earlier improvements the record indicates that Washington was his own architect and landscape gardener. Like other 18th-century gentlemen in America, he borrowed and adapted what he needed from contemporary structures and illustrated architectural books. "Undertakers," as contractors were then called, and skilled workmen, when they could be found, did the rest.

One interesting detail in construction credited to Washington's ingenuity was the use of rustication boards of Virginia pine to sheathe the mansion and service houses. Painted white, beveled, and sanded for roughness, the boards give the impression of stone blocks (page 660).

Nor was Mount Vernon's master above taking a hand on the job. "He . . . often works with his Men himself; strips off his Coat & labours like a common Man," commented a guest of 1755.

Ladies to the Rescue

The period between Washington's death and the revival of Mount Vernon as a patriotic shrine was an interlude of disintegration.

The 8,000 acres that Farmer Washington had gradually accumulated were divided and subdivided among heirs. His and Martha's possessions were scattered far and wide. Their house passed first to one of Washington's favorite nephews, Bushrod Washington; then to a grandnephew, a great-grandnephew . . . finally to the Mount Vernon Ladies' Association of the Union.

How the Ladies rescued Washington's old homestead from eventual oblivion is itself a drama of struggle and achievement, with a heroine of frail body and indomitable will.

It began with an incident aboard a steamer sailing down the Potomac on a clear moonlit night in the fall of 1853.

"I went on deck as the bell tolled and we past [sic] Mount Vernon," Mrs. Robert Cunningham, a passenger returning to South Carolina, wrote to her daughter soon afterward. "I was painfully distressed at the ruin and desolation of the home of Washington." If the men of this country couldn't do anything, she went on, why shouldn't women try?

Why not indeed, thought daughter Ann Pamela Cunningham. A red-haired semi-invalid whose energies had had little outlet since a girlhood accident, she found in Mount Vernon a cause worth fighting for (page 661).

Dining-room: Ceiling and Mural Decorations Were Added During the Revolution

The [illegible] Most of the [illegible] are [illegible]

A Old Kitchen Garden Flourishes Again

[illegible]

[illegible]

[illegible]

Who Laid Mount Vernon's Cornerstone? Historians Cannot Agree

[illegible]

[illegible] Federal Government [illegible] and [illegible] [illegible] private [illegible] [illegible] asked [illegible] to the [illegible]

On December 2, 1853, [illegible] letter [illegible] the Charleston Mercury. Addressed to the ladies of the South, it [illegible] funds to purchase Mount Vernon [illegible]

The writer signed herself "A Southern Matron." [illegible] Mount Vernon [illegible] Miss Cunningham [illegible]

[illegible] Mount Vernon Ladies' Association of the Union. [illegible] Miss Cunningham [illegible]

[illegible]

[illegible] West Point, [illegible] New York [illegible]

[illegible]

Miss Cunningham Missed the Boat

[illegible]

By 1858 the Ladies had the money to purchase the Mount Vernon [illegible] John Augustine Washington [illegible]

[illegible] to Mount Vernon, where [illegible]

A Lady Matter Misses New Girls Posts in the Colonial Manner

[illegible]

[illegible] was married [illegible] the steamer had sailed on without her.

The long wait for the next sailing gave Miss Cunningham another chance. Before she left, she felt she had won her victory. It was two years before [illegible] were gathered in the association's [illegible] and its [illegible] line.

[illegible] this [illegible] increased to nearly 50 [illegible] President of what George Washington [illegible] Mansion House Farm.

Washingtons Moved Out in 1860

The last Washington family to live at Mount Vernon moved out in the spring of 1860. Among remaining gifts to the new owner were the key to the House, the terrestrial globe George Washington kept in his [illegible] and the priceless list of the General's [illegible] from [illegible] by Houdon (page 640).

But the Ladies' troubles and hardship began. The Civil War [illegible] to place [illegible] Mount Vernon [illegible] returned to South Carolina for what she thought would be a temporary stay. She was there for the [illegible] Tracy of Troy, New York—young, pretty, and valiant—kept the Washington memorial going.

It was a [illegible] and adventurous [illegible]. Miss [illegible] letters [illegible] the Mount Vernon [illegible] reminiscences, [illegible] readers.

[illegible] between the two [illegible] a few miles [illegible] Potomac [illegible]

"Could [illegible] about the [illegible] until there was [illegible] for the [illegible] Laborers must be [illegible] and on something more substantial than would satisfy [illegible]

To win neutrality for Mount Vernon [illegible] permission to carry the mail and access the [illegible] line, North [illegible] and again heckled the Union generals in Washington. Once President Lincoln gave her [illegible]

[illegible] of Mount Vernon [illegible]

Queen, Prince, and Hostess Inspect the Guest Book

[illegible]

Oranges Ripen in the Greenhouse

[illegible]

a lie, dodged through woods, and argued with trigger-nervous sentries.

Through it all, Mount Vernon remained unharmed. It was an island of peace to which both Union and Confederate soldiers came curious to see how the father of their one united country had lived. Stacking their guns outside, they behaved almost invariably with patriotic respect and restraint.

At war's end, when Ann Pamela Cunningham returned, she found not deterioration but repairs.

There was even a romantic flip. Sarah Tracy later married Upton Herbert, a kin of John Augustine Washington, who had stood at her side during the wartime trials as the association's first superintendent.

Work Never Done

Since the Civil War, work on Mount Vernon has never ceased.

The association has just reconstructed George Washington's big greenhouse, which burned down in 1835. This structure, the last of the major building projects, was put up only after years of research.

The greenhouse proper, facing the flower garden, smells now of warm earth and plants and is true to Washington's time in typical orange trees and in underground flues such as heated the early building. Its wings represent the old slave quarters and the once busy cobbler's shop, re-created now with workbench, tools, and worn shoes.

Gradually, as Mount Vernon's basic construction has taken form, more attention is being paid to scene-setting detail.

I was surprised recently to find workmen removing the bricks in the foundation of the long-exhibited spinning house.

"They looked too modern," explained Mr. Wall. "So we're substituting smaller, less regular ones. These are the real thing. They're discards from the inner brick walls of the reconstructed White House."

Mount Vernon's enormous collection of 18th-century furnishings and belongings has been acquired by gift, loan, and purchase.

Valuable pieces have been obtained from descendants of the Washington family and friends; from antique dealers, art galleries, and even junk shops. They've been bought by private collectors, museums, and universities, and picked up at obscure auction sales.

Each year brings additions—a wig box, say, a mourning locket, letters, books, and rare old china.

I saw a small battered trunk one day in the office of Mr. John E. Riggs, Mount Vernon's research associate. "This has just come in," he said, "from a descendant of one of Washington's servants. The copper plate engraved with Washington's name just matches one on a trunk we have."

Likely articles sent to Mount Vernon get careful checking.

"We've been offered three original banquet tables," Mr. Wall chuckled. "If we accepted [illegible] generations."

[illegible] certain objects have been discarded or decorations changed. A wallpaper pattern once used in Washington's bedroom, for example, has now given way to the dull whitewashed plaster the General knew.

Maintaining Mount Vernon as an exhibit requires the services of as many people as worked here in George Washington's day.

Among the association's 55 employees are guards, engineers, handymen, carpenters, gardeners, maids, cooks, secretaries, librarians, and researchers.

The estate has its own cattle, sheep, horses, dogs, and a beehouse producing honey. The beehives, incidentally, are a striking example of reconciling old and new. Under the molded straw facsimiles of old fashioned hives are standard removable-frame units required today (page 672).

A sticker problem of combining historical accuracy and modern needs was involved in the installation of heating and lighting facilities.

"You really have to search for them," said Mr. Wall as he showed me a warm-air vent beneath fireplace logs and a concealed fluorescent light bar above the doorway of the windowless larder.

Upkeep and Protection Huge Jobs

To protect the mansion from fire, the estate's central-heating plant, put in more than half a century ago, is 400 feet away. No one is permitted to enter the big house after dark. An elaborate fire-fighting system has been worked out. It includes the latest equipment: automatic fire detectors, chemical-gas installations in the walls, and extra water supply.

[illegible] The fire track already was out in front when I rushed out. But it was a false alarm.

Powerful searchlights play over Mount Vernon lawns at night to flush up intruders bold enough to scale the estate's high walls. Trained watchdogs accompany the guards on their rounds (page 670). Electric eyes at strategic spots are ready to give the alarm.

"Yes, it's true," said Mr. Wall, "that small objects are wired down to discourage souvenir collectors. But vandals and pilferers are the least of our worries. Not one in a thousand

Mount Vernon's Hose Cart Arouses Sightseers

Paths Wind Among the Flowers to a Garden House, But Washington Once Referred to as the Schoolhouse

Mount Vernon Always Rates a Salute from U. S. Navy Vessels Passing by Day

[illegible]

[illegible] uniformed [illegible]

[illegible]

Ladies Celebrate 100th Birthday

This October the Ladies came again from all over the country for their annual administration [illegible] Mount Vernon. But some [illegible] for 1953—a [illegible] 100th [illegible] the [illegible] and strength [illegible]

[illegible] Mount Vernon [illegible] of giant cameras, the [illegible] Mount Vernon to a [illegible]

[illegible]

"Let them see," Ann Cunningham [illegible] the hearthstone seems to have [illegible] in America, let them see that [illegible]

Native's Return to Norway

An Old World Town Takes Back to Its Heart an Emigrant Son Home After a Quarter Century to Visit Family and Haunts of Youth

By Arnvid Nygaard

With Illustrations by Andrew H. Brown, National Geographic Staff

IF MY family thought my disappearance strange just the day following my return to Mandal after 25 years away, they gave no sign. Perhaps they guessed I had climbed Utsnienborg, the tiny brown hill that overlooks so many landmarks of my youth.

My mother at least must have remembered how, as boys, my playmates and I often went there to search the sea that rippled invitingly out to the horizon. On Utsnienborg's crest, dreams knew no restraint. My young friends and I shared a common yearning — to sail away over that horizon as soon as we grew up.

Back to Boyhood Scenes

Well, I was one who had fulfilled that hope. Now, from my home in America, I was back again, scanning the old familiar scene.

The red tiled roofs of Norway's southernmost town huddled at my feet. As of old, small ships lay in the bend of Mandal River where it curves away to meet the sea. On a distant island the red-and-white finger of Ryvingen Lighthouse still spiked the sky.

Two-and-a-half decades had wrought little visible change, it seemed to me at first.

Nearing Mandal the day before, I wondered if I had perhaps stayed away too long. Would the sights, sounds, and feel of the place hold the same appeal a generation later? Would friends of long ago remember me?

My mother and two sisters had driven to the port of Kristiansand to welcome me back to the land of my youth. When we met on the dock, there was an awkward instant of seeming almost strangers — but only an instant.

Then my mother greeted me, saying, "I can scarcely believe you're home. Remember, you were 'surely coming' twice before."

"Looks like you plan to sta[illegible] with a laugh, spotting my three [illegible] army foot locker.

Nora filled of words, but her warm smile gave an affectionate "hello."

Passing years and turbulent events had wrought changes in us all. Eldrid, on vacation from her position as di[illegible] hospital, had been 18 when I sailed away. [illegible] bright eyes and fresh complexion belied her graying hair. Nina, only two when I left, had grown up to become a spare right hand for my mother, now nearly 75 (page 686).

Since my going away these and others of my family had lived through the depression era, a world war, and five years of German occupation. My father, a newspaper publisher and editor for more than 40 years, had died in 1943. The thought of never seeing him again hadn't even occurred to me when I left.

When our car bounced off the old bridge over Mandal River and entered the town itself, I saw the same neat cluster of white houses I remembered. Windows were gay with geraniums and petunias. Store Elvegate (Big River Street) looked much as in my boyhood days — narrow, cobbled, and jammed with bicyclists darting among the crowds afoot.

Our family home at the foot of Kirkebeia (Church Hill) was little altered. The annual dress parade of tulips brightened the garden. I missed the red currant bushes, an apple tree, and a pair of plum trees, all casualties of time. But spruces my father planted, pines and birches that were saplings when I left, now cast long pools of shade.

Inside, our house had been remodeled and re-equipped. But it still held out to me the restfulness of the well-loved and familiar.

Midnight came and went before the first gush of news and gossip had spent itself. Yet, at 58° N., 1,100 miles farther north than New York City, a dim, greenish light still suffused the sky.

Brothers Meet After 25 Years

Dozing, I recalled fleetingly the long journey from Washington, D. C., where my wife awaited my return.* For how many years had I dreamed of this homecoming!

Next morning, in full sunlight at 4:30, magpies chattered outside my window. Other mornings the crying of gulls awoke me.

"My, how fat you are!" my brother Fridtjof greeted me, with a laugh, when I stepped into the office of the family newspaper, *Lindesnæs*. I must be a big gun, he added. Demurring, I seized his right arm in both my hands.

Across piles of newspapers in his crowded office, Viktor, my oldest brother, reached for my hand and shook it hard. A bridegroom when I had left Mandal, Viktor was now the father of five children.

* Mr. Nygaard has served as the National Geographic Society's chief translator for 23 years.

Arnvid Nygaard, Returned from America, Lands Across His Norwegian Birthplace

[illegible] Mr. [illegible] had [illegible] space to grow; so it built new [illegible] on man-made land. Here the [illegible] 5 years, looks across Mandal [illegible]

[illegible] Viktor had [illegible] In addition, he was [illegible] chairman of the [illegible] for [illegible] letter. During the [illegible] tion German [illegible] visited Viktor for "noncooperation" and threw him into a concentration camp in Oslo.

When [illegible] Viktor said, that when [illegible] at last came [illegible] should [illegible] business! I hadn't seen Oltar and still haven't—since he was 17.

Leaving the *Lindesnes* office I threaded old familiar streets. They were a bustle with [illegible] Then [illegible] stopped [illegible] shop. It was [illegible] Russian [illegible] and [illegible]

[illegible] Gabriel [illegible]

[illegible] thanks for the last time we met [illegible] friends [illegible]

[illegible] Lies [illegible] between hills and river. Shops, office buildings, and homes appear to have been dropped there at random. This helter-skelter growth has left a [illegible] kink in the main street. So re Edvarde [illegible] is a photographer's delight but a truck driver's nightmare.

Main Street 12 Feet Wide

Haskenalsen ("the bottleneck"), unpaved [illegible] to a walk [illegible] Some [illegible] 12 feet [illegible] Rådhus [illegible] 13 feet from wall to wall. This [illegible] only route through the [illegible] of town.

When two vehicles [illegible]

Scorning Still Waters, a Farmer's Horse Drinks from the Fountain's Running Stream

[illegible]

narrows, one or the other must back up to a wider spot to allow passing.

There is a saying ... Mandal people walk in the middle of the street. [illegible]

[illegible]

[illegible]

[illegible]

upon us the Mandals ... Mandal's Savings Bank ... I wanted to say hello to the president and [illegible] and to reminisce with John Kristensen [illegible]

John went with me to [illegible] We recalled old times [illegible] jumping contests and trips through forest and mountain. The longer we talked the less John Kristensen seemed to have changed.

"Carriage Trade" Lost to Cars and Buses

After lunch I ran into another friend, Charles Christensen, [illegible]

Often I had passed [illegible] I would wave goodbye to my [illegible] to the quay where I [illegible]

Mother Nygaard Feared She Might Never See Her Wandering Boy Again

[illegible]

[illegible]

[illegible]

Adolf Qvist Surveys Bicycle Traffic from His Shop Window on Mandal's Main Street

[illegible]

so here to get [illegible] save the cream. Then you wouldn't have [illegible] some pints splashing all over your clothes [illegible]

[illegible]

[illegible] the Farmers' House [illegible]

[illegible]

[illegible] Mr. Mandal.

Author Welcomed as "Spy"

[illegible]

Life in Mandal seems to [illegible]

[illegible] that Man-

Picnicking Fathers and Sons Take Annual Leave from Wives and Mothers

[illegible]

That same day I ran into Olaf Spilling [illegible] acquaintance who never [illegible]

[illegible] and, [illegible] out of [illegible]

Spilling, then the manager of a small sawmill, hired me [illegible] Nyman and [illegible] Spilling [illegible] head of the [illegible] Marion II [illegible] sawmill [illegible] per [illegible]

[illegible]

Manual Labor on the Salmon

[illegible] the Manual River [illegible] [illegible]

[illegible]

its origin. In its coat of arms three salmon swim on a shield topped by a crest.

Early Mandal boomed as a trading and shipping center. Its merchants and shipowners grew rich, sawmills and shipyards thrived. Huge keel and mast timbers from nearby forests were premium export items.

In sail's heyday as many as 120 ships of several nations lay moored in the harbor of Kristiansand, Mandal's nearby deepwater port. By 1878 Mandal's sailing fleet numbered 128 vessels.

In the age of steam the town never acquired an important fleet, and manufacturing has become its mainstay. The largest plants make rope, marine engines, wire, and cable.

Mandal also has shipyards. Other workshops turn out nuts, paper products, textiles, furniture, and truck and bus bodies.

Local meats, vegetables, and fruits are far cheaper in Mandal, I found, than in larger cities. Strawberries or fish, for instance, cost only half as much here as in Oslo.

No dish, in my opinion, surpasses a boiled Mandal salmon served with a sauce of grated horseradish and sour cream. Two other favorite foods of my young manhood I missed because of the time of my visit.

My mouth waters when I think of the [illegible] that arrive with autumn. Another [illegible] I had to forego was auks, tasty sea birds we used to broil in the oven and then bake in a game sauce.

Boats Substitute for Cars

Mandal still turns to the sea to play. Nearly 400 motorboats, most of them built there, jam the water front. Substitute for the American's automobile, they are about 22 feet long, with a 6- or 7-foot beam, and are remarkably seaworthy.

Bays, fjords, and island clusters make the region a paradise for cruising. On summer evenings the air is rarely free of the chug-chug-chug of boats nosing out toward the sunny skerries. Some set a course for holiday cottages (Norwegians call them "huts") that snuggle in coves or perch on headlands.

Every fine afternoon Fridtjof's boat went hobbling out to sea, jam-packed with our family, friends, and baskets of picnic fare. In some sheltered spot among the bleached and surf-smoothed rocks we loafed and talked.

The youngsters pounced on periwinkles and pulled ribbons of seaweed out of the tide wash. They kept an eye cocked for snails, bright stones, and sea urchins.

Someone always made a fire and brewed coffee. We all tucked away sandwiches and slabs of *kitt kake* (soft cake), topped with gobs of whipped cream.

Fishermen pulled out "box fishing" outfits, characteristic of southern Norway. They resemble small cooking pots. A wooden handle inserted across their mouths gives a firm grip on the rig; the line is wrapped around the outside. The fisherman grasps the handle in his left hand. When he holds the rig out from his right side and swings his jig-, or [illegible], hook round and round and lets [illegible] it, the line unreels freely.

Picnic for "the Big Boys"

More than 25 years ago a group of Mandal businessmen promoted a picnic "for men only." The idea caught hold, and the Big Boys' Picnic became an annual affair. When I was there word got around on Sunday, July 6, that next day the Big Boys would picnic on the sea-scoured rock of Naudholmen.

All Monday afternoon motorboats swept out of the river mouth and headed for Naudholmen. I was with a group in my brother's boat. Mandal, temporarily a town of women and children, dropped out of sight.

Throughout the early evening, boats kept arriving until more than 150 nuzzled the shore. Men brought sandwiches, cakes, and cookies. Coffee was boiled in huge kettles, volunteers passed among the picnickers pouring out the hot, strong brew (page 689).

When daylight faded, the five or six hundred men gathered around the huge bonfire. Every stick of the wood had been brought by boat. A band played and everyone sang.

When the flames died down, the Big Boys ambled down to the shore, jumped into boats, and headed for home—and the complications of a society half in skirts.

All around Mandal I found impressive relics of the German occupation, for the Wehrmacht stationed a sizable force there. Because of its sand beach, deep coves, and far-from-impregnable terrain, there always was a chance of counterinvasion.

On Sjøsanden beach the Germans laid thousands of mines. They fortified every high point around with trenches, bunkers, and gun positions. Norwegians did most of the work, impressed for the wretched job of making their land impregnable to their friends.

Imprisoned for Spreading News

Guns and wooden buildings are gone, but rolls and barricades of rusty barbed wire still lie about. Dark, dank underground works remain as monuments to a colossal—if fortunately futile—effort.

A typical victim of the war years was an old acquaintance, Lars O. Rolfsud. During the war he helped distribute the gist of British broadcasts picked up on a hidden radio. Mandal Savings Bank employees ran this underground news service.

[illegible]

Pedestrians and Bicyclists Duck into Doorways as a Bus Squeezes Past

[illegible]

"Most of the [illegible] were [illegible] by the [illegible] [illegible] Germany [illegible]

[illegible]

With [illegible] packages of [illegible] to needy [illegible]

[illegible] World War I [illegible]

[illegible]

[illegible]

[illegible] World [illegible]

[illegible]

FRANKLIN L. FISHER

1888–1953

To the Board of Trustees, the Officers, the entire staff of the National Geographic Society, and a host of friends [illegible] the sudden passing of Franklin L. Fisher brings a [illegible] of loss. Mr. Fisher, Illustrations Editor of the NATIONAL GEOGRAPHIC MAGAZINE and [illegible] in [illegible] 1913, [illegible] died while [illegible] in Los Angeles on August 11 [illegible] in the morning. And [illegible]

Mr. Fisher had gone to Los Angeles to receive the La Belle Award on behalf of the National Geographic Society. The Society and the NATIONAL GEOGRAPHIC MAGAZINE had been chosen for this honor by a committee of the Photographic Society of America for outstanding contributions to the development of color photography in [illegible] illustration. Fittingly he represented [illegible] the Society's [illegible] and [illegible] contributions to the pioneering of the NATIONAL GEOGRAPHIC in this field.

A native of Horseheads, New York, Mr. Fisher began his professional career in 1907 in New York City, where for three years he [illegible] in [illegible] news and feature photography [illegible]. Coming to Washington, [illegible] he joined the Harris & Ewing Photographic New Service, [illegible] the [illegible] staff of the NATIONAL GEOGRAPHIC MAGAZINE.

Always [illegible] in color [illegible]. The Magazine had presented its first color [illegible] in [illegible].

Working closely with Dr. Gilbert Grosvenor, the Editor, and with Dr. John Oliver La Gorce, Associate Editor, Mr. Fisher built around him an outstanding corps of skilled photographers and illustrators. The NATIONAL GEOGRAPHIC for many years was the [illegible] magazine to photograph systematically a [illegible] and to date has presented 17,812 natural-color [illegible] photographs and [illegible] ranging 64 or 72 pages of [illegible].

During Mr. Fisher's [illegible] the Magazine [illegible] a [illegible] series of [illegible] [illegible] work [illegible] under his [illegible]. The [illegible] library of photographs [illegible] [illegible] the world for future [illegible] the Society's publications.

Franklin Fisher had a [illegible] for life and for friendships. He was a [illegible] and discriminating [illegible] and [illegible] [illegible]. With a [illegible] of [illegible] and [illegible] [illegible] advice and encouragement to [illegible] friends in many [illegible]. The [illegible] for [illegible] [illegible].

Crete, Cradle of Western Civilization

With United States Help, Hard-working Cretans Have Erased War's Scars from Their Historic Bomb-rocked Island

By Maynard Owen Williams

With Illustrations from Photographs by the Author

Crete, [illegible] a heroic part. Axis forces in World War II had fortified its airfields, dogged its medieval ports, laid low its chief cities. Not since about 1400 B. C., when fire and plunder broke forever the power of the Sea Kings of Crete, had such violence shaken this island cradle of Western civilization.

In present days I had roamed the lovely isle from end to end. I hung my clothes on masses of pink oleander while I swam in the wine-dark sea. I photographed minstrels as they rested in humble taverns beside the dusty road, and shy mountain women clad in authentic old costumes assembled from the chests and closets of a whole village.*

I knew Crete as an island of peace and beauty—and had seen how explorers with the spade had uncovered its tremendous contributions to the flowering of civilization on the mainland of Greece. Here in the home of the first great sea power Cretans used linear characters for writing centuries before the time of the Phoenicians. Their art shows pale Parisian-looking ladies in high heels, big hats, and tight corsets; and tanned, slim-waisted long-haired men (page 703). In housing and sanitation, too, Cretan civilization reached a high level 3,500 years ago.†

Hard Work Has Paid Off

Within minutes of my return in a shiny DC-3 I saw evidence aplenty that the friendly, hard-working Cretans of today have performed miracles in restoring their war-torn island, largest of the isles of Greece. As if to show what they have had to overcome, one section of Canea (Khania), a short jeep ride from the airport at Maleme, still lies in troubled ruins. But around it remain few evidences of war's destruction; here, beside Canea's medieval fortress, I saw Cretan townfolk hard at work building new homes.

Alongside Canea's bar or a colorful crowd gathered after church to see a steamer come in. Here are crowded warehouses where once were great galley ships that served the far-ranging argosies of rich merchants of Venice.

Four years ago, I knew, these warehouses bulged with relief supplies from the United States—milk for undernourished children and grain for a stony island that had had poor crops. Now, with Crete's economy healthy enough to permit the shipment of fruit, wine, and olive oil, Canea's warehouses are regularly filled with export goods.

His smiling John Asher, an American friend working with and for the Cretans, went with me on a trip around the island. Both of us had acquired some of the local tastes, and when we stopped for a hardy breakfast we were pleased to find that the main course was Cretan cheesecake.

This delicacy, good rich peasant fare, appeals to the stomach rather than the eye. Two feet in diameter and an inch thick, the well-browned tongue-burning pastry is stuffed with cheese made from the milk of goats and sheep.

When a customer arrives, a goodly slab of *bougatsa* is cut off and sprinkled with sugar. With a huge knife the delectable mass is further cut into mouth-sized, piping hot pieces.

Roads Built, Malarial Swamps Drained

On the narrow isthmus between Canea and Suda Bay (Kólpos Soúdhas) we stopped to inspect a new rock crusher serving Crete's good-roads program, which already has considerably improved the island's transportation facilities (page 697). Near by we saw where new ditches have drained death from mosquito swamps. Malaria, thanks to DDT from the U. S. and a drainage program carried out in part by the Cretan villagers themselves, is no longer a scourge of this sunny isle.

Suda Bay, east of Canea, is the finest harbor on the island. It was used by the Minoan Sea Kings, among the first men known to have set a sail to snare the wind. Here, early on May 20, 1941, German dive bombers, fighters, and transport planes towing glider trains began their blitzkrieg from the sky. By June 1 Crete had joined mainland Greece as an Axis-occupied area.

Near the western end of great Suda Bay, the only Cretan harbor well enough protected for large vessels, the British cruiser *York* once lay while Axis raiders left her. Today Suda Bay and Crete's other ports are almost free

* See, by Maynard Owen Williams, in the NATIONAL GEOGRAPHIC MAGAZINE: "[illegible] Crete," December, 1949, and "Where Ancient Sea Kings Held Sway," 34 [illegible] in color, February, 1949.

† See "The Sea-Kings of Crete," by James Baikie, NATIONAL GEOGRAPHIC MAGAZINE, January, 1912.

Candia's Cathedral Rises from a Sea of Tile Roofs. Mount Ida Lifts a Snowy Head

[illegible]

[illegible] wages [illegible], thanks to a self-supporting clean-up campaign. [illegible] iron and steel from wrecked warships [illegible] clearing harbors [illegible] hulks.

Returning from a visit to [illegible] lighthouse and old fortifications [illegible] Spinalonga Island, our arrival [illegible] greeted at Kaliviá [illegible] [illegible] Spinalonga's village Tall [illegible] then hands were home-grown mitts of fresh flowers; some were [illegible] wreaths in their hair.

Kaliviá has set a shining example for all Crete. Every village man gives two weeks of his time each year to community projects: [illegible] Damage dates [illegible] started in 1[illegible]. [illegible] has spread throughout Crete.

Our ride eastward on the [illegible] was like unrolling a pleasant scroll—smiling countryside between snowy mountain and sparkling sea.

Outside a humble inn we stopped to rest our spines and scald our taste buds with "Turkish" coffee while the sun climbed on a clear little [illegible] brought again after [illegible] destruction of communications. Whether some Axis commando or German [illegible] trooper here paid with ransomed for a few hours of safety makes little difference now. Traffic moves along the vital highway from Canea to Candia, a city fortified by the Saracens, who chose it as their capital. Known as [illegible] (apparently Herákleion) to its residents, the city of Hercules was called Candia by its Venetian rulers [illegible].

Once Candia's battlements echoed the din of high adventure and stubborn siege. Within the Venetian walls oppressed citizens hoped Genoese or Turkish troops would bring more tolerant rule. But the massive [illegible] were stronger than the people [illegible] Crete remained under Venetian [illegible] 1669 when it succumbed to Turkish arms.

Some of these walls long ago gave up their [illegible] role to [illegible] "armamentarials." [illegible] [illegible] with [illegible] [illegible] [illegible].

[illegible] in the last war [illegible] bombing from the air. Very much has been rebuilt. [illegible] of table grapes, raisins, olive oil, and fr[illegible] Britain, Central Europe, and the Americas in return for grain, building materials, and fuel.

Candia's outer [illegible] was made to give sea traffic. [illegible] [illegible] blocks [illegible].

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A Cretan Farmer Clings to Time-honored Fashion

Long [illegible]

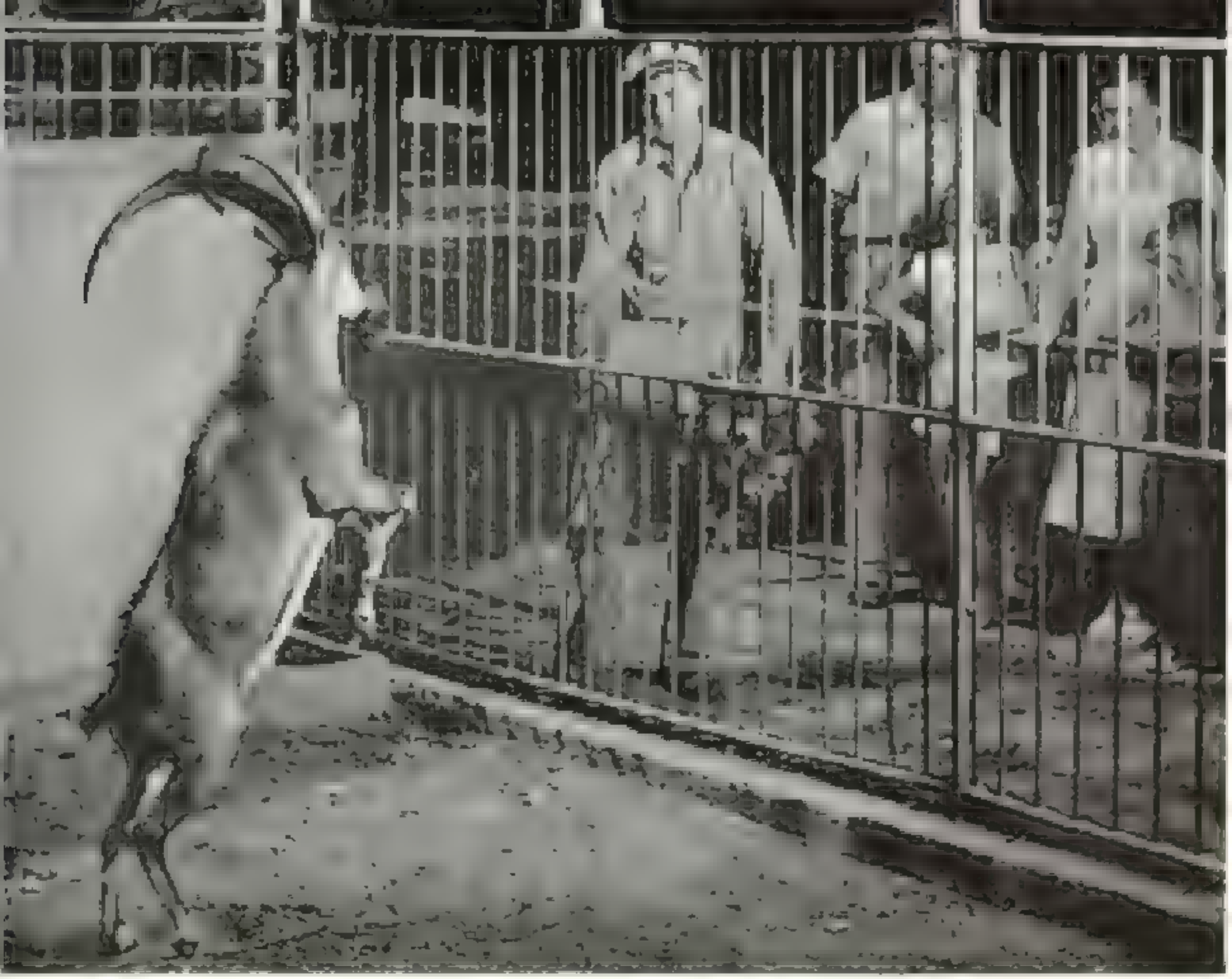
[illegible] so extend the breakwater and enlarge [illegible]. Imaginative engineers named Candia's three tiny islets *Afinos, Theseus,* and *Ariadne.* [illegible] fascinating legend to their works by task.

Theseus Whistles at *Ariadne*

Once during a previous visit I chuckled at hearing *Theseus* whistle at *Ariadne*—dirty [illegible]. I forgot [illegible] wondered Theseus not [illegible] the far-reaching consort of the Ariadne, consort of their queen [illegible] Crete's monstrous Minotaur [illegible] No. 1 in Greek mythology.

[illegible], was no clanking machine but [illegible] who saved young Theseus [illegible] thread, enabling him to [illegible] steps and so escape from the [illegible] King Minos at Cnossus—and [illegible] escape her [illegible].

[illegible] at the Palace of Minos one first should see unique treasures of the Minoan Age in the Candia Museum. Here [illegible] photographed huge Ali Baba



A Bearded Ambassador of Cretan Good Will Greets Visitors to Washington's Zoo

[illegible] National Zoological Park [illegible]

[illegible] and graceful proportions [illegible] designs. [illegible] Rockefeller Center in New York. [illegible] the [illegible] Minoan times.

[illegible] the United States [illegible]

[illegible] visitors to [illegible] the [illegible]

[illegible] the Minoan [illegible] with conveniences and comforts with which the Sea Kings were familiar.

Minoan Monuments Beautiful but Dumb

As yet, mute Minoan monuments [illegible] script has never been [illegible]. But [illegible] were great traders. [illegible]

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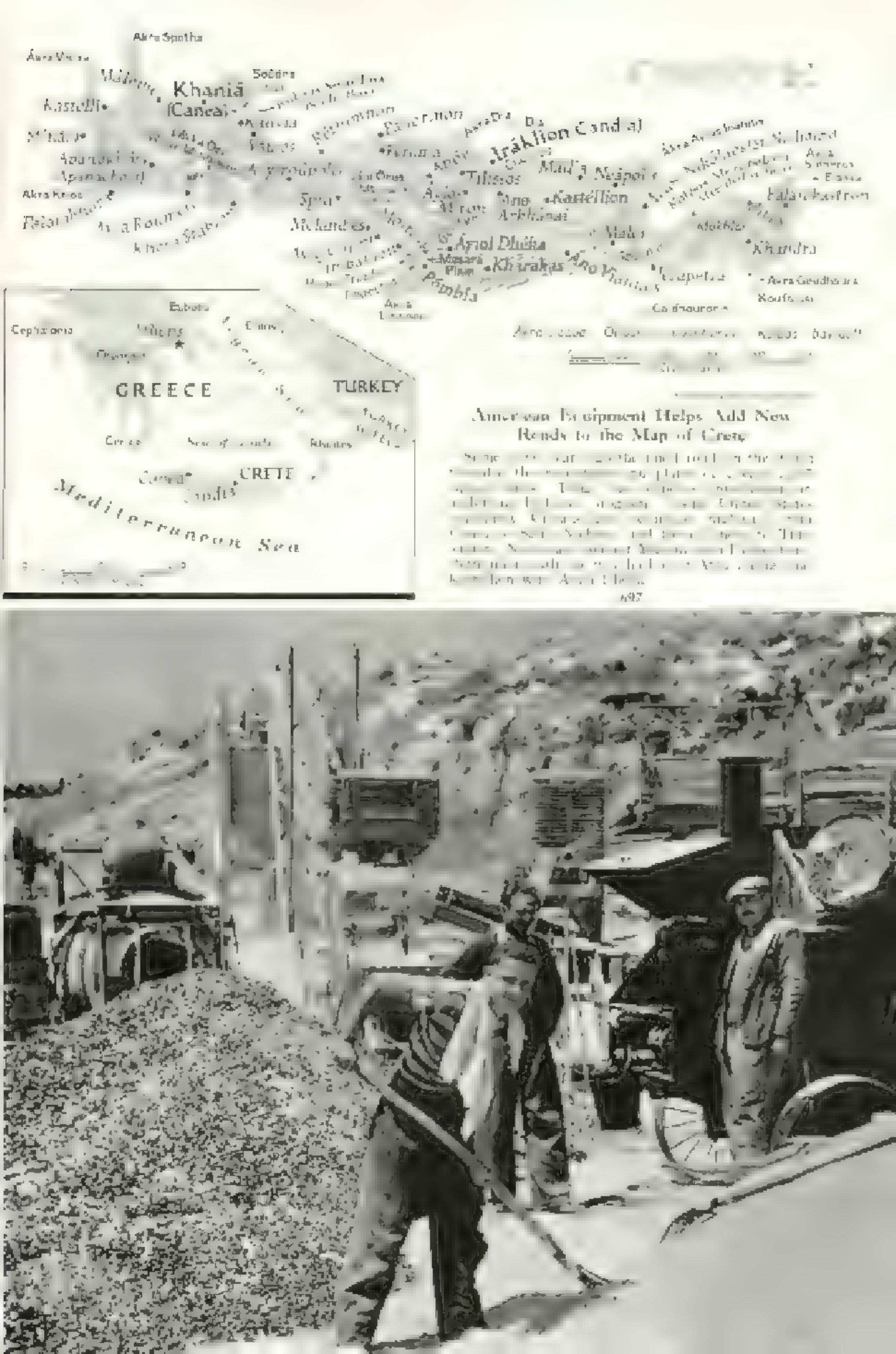
* See [illegible] "When the Sea Kings [illegible]" [illegible] National Geographic Magazine [illegible]



American Equipment Helps Add New Roads to the Map of Crete

mute testimony of monuments may become eloquent, and Crete's historical horizon may be pushed back by hundreds of years.

A Connecticut Yankee at King Minos's court might have felt at home. Modern admirers of pin-up girls would delight in paintings of slender Minoan maidens who turn graceful somersaults over the deadly horns of bulls larger than any existing in Greece today.

Buxom members of the painted audience suggest a fecund Mother Goddess; also pictured are shy maidens wearing diaphanous blouses and a ceremonial knot, like a shoulder-high Japanese *obi* (sash). When the excavator came upon one such youthful ancient, her girlish charm preserved by an artist dead for 1000 years, he exclaimed, "La Parisienne!" The Minoan maiden reminded him of Paris.

How deep-chested and wasp-waisted were Cretan men was revealed when frescoes in the south porch were unearthed and painfully reconstructed (page 703).

Bumper Crops Reward the Farmer

As we jeeped east from Canea toward Salat Nikolaos, or Aylos Nikolaos (page 700), and the prehistoric sites of Gournia, Mókhlos, and Sitia, we passed wide fields of scarlet poppies. Near Malliá the white sails of scores of windmills fanned silver-gray olive trees as they lifted water to fields where women were harvesting grain and digging potatoes (page 702).

Energetic Cretan farmers have not been idle while foreign aid has flowed into their land. Bumper postwar crops of grapes, olive oil, and citrus fruit, the island's principal exports, attest Cretan energy and resourcefulness.

As a result, United States aid has dwindled to a trickle. During the 1951-52 fiscal year, 455,000 tons of grain were sent to Greece, 23,400 of it direct from U. S. ports to Crete. During 1952-53, only 10,000 tons were sent direct. Of 279,000 tons of grain imported by Greece during that period, the Mutual Security Agency paid for only 193,000 tons; the Greeks, thanks to a reviving foreign trade program, were able to pay for the rest.

Not all of Crete's foreign aid has come from the United States Government; U. S. citizens have played a part as well.

Last August the dedication of a 200-bed hospital near Canea was attended by a group of United States citizens of Cretan descent. Members of the Pan-Cretan Association they represented the many Cretan Americans living in this country. The Pan-Cretan Association contributed $450,000, and the balance of $800,000 came from counterpart funds made available to Greece through the U. S. foreign aid program. The hospital stands, appropriately, on a hill overlooking the ruins of Knossos, symbol of Crete's ancient glory.

On the day following the ceremony at Canea, another hospital was dedicated on the island. A 70-bed structure at Réthimnon on Crete's north coast, it cost $800,000. For this the Pan-Cretan Association gave a token $50,000; the Greek Government paid the balance out of U. S.-supplied counterpart funds.

Wall Preserves Greek Laws

The road across Crete is picturesque enough, and the Mesará Plain is broad and rich; but the star attractions south of the mountains are Phaistos and Hagia Triada, both with Minoan palaces, and Gortyn, a metropolis in Greek and Roman days.

Old columns and headless statues still dotted in Gortyn, but olive trees and grain fields have obscured the site. Today's chief interest is a curving wall, higher than my head and 10 yards long, its inner surface covered with some 17,000 Greek letters recording an early Greek code of law.

We write and read from left to right; the Arab from right to left. The men who carved the Gortyn law code, following a Hittite custom, wrote in both directions.

An Indian might call the method that of Heap-Big-Ox-Plows-Field. But the Greeks had a shorter phrase, *boustrophedon*, "the path of the turning ox."

Before I flew back to Athens, the gods of the air gave me a final bonus. The morning flight had been delayed. Iolanthe Nazaki volunteered to model the colorful Cretan costume worn on feast days and in historical pageants (opposite).

Symbol of Liberty and Gratitude

Not long after my return from Crete, a visitor from that friendly sun-drenched island took up residence in Washington, D. C. He is a Cretan agrimi, a mountain goat with black beard and sweeping horns (page 696). A symbol of liberty to the people of Crete, Kri-Kri was captured in the island's rugged White Mountains (Lévka Óri).

Daily, visitors to the Nation's Capital pause before Kri-Kri's enclosure in the National Zoological Park to exchange a glance with this ambassador from the far end of the Mediterranean and to read the words on a marble tablet which came with him:

PRESENTED TO THE PEOPLE OF THE UNITED STATES BY THE PEOPLE OF APANACHORI, CRETE, AS A MARK OF FRIENDSHIP AND GRATITUDE FOR MARSHALL PLAN AID.

Surely no more unusual ambassador ever came to us than this high-jumping animal with his message of appreciation from the people of a war-impoverished land to those who extended a helping hand from America.

A Grecian Mirror Reflects a Sculptured Form Like Those on Ancient Greek Vases

[illegible]

70

Cretan Fishermen at Mirabella Bay Spread Their Nets on Sun-baked Wastes of Saint Nicholas

Smiling Youngsters and Bridal Flowers Welcome the National Geographic Photographer to a Seaside Village

[illegible]

White Sails of Creton Windmills Hum and Spin Like the Circling Wings of Pigeons Wheeling in the Air

Hundreds of these mills that are scattered over the [illegible]

Naked Youths with Flowing Locks and Wasp Waists Parade Across Crossus Palace Grace: Cretan Art Was Modern 3,500 Years Ago

[illegible]

Greeks, Whose Love for Athletics Inspired Our Olympic Games, Line Up for a Sprint in Ancient Greece.

A Sick Bear to Old and Young in the Cocina Carried

[illegible]

[illegible]

[illegible]

[illegible]

Claudia Witnesses a Gesture of Good Will: U. S. Wheat Swings Ashore

[illegible]

We Lived in Turbulent Tehran

An American Quaker Educator's Wife Tells of Housekeeping for Two Years in the Colorful, Strife-torn Capital of Iran

By Rebecca Shannon Cresson

FOR two of the most troubled years in modern Persian history, our family of four lived in Tehran, capital of Iran.

We arrived amid all the excitement attending Premier Muhammed Mossadegh's seizure of the Iranian oil fields. Workmen were repainting the gas pumps, systematically effacing the insignia of the Anglo-Iranian Oil Company. Behind the elaborate grill of Parliament's iron gate, Iran and Great Britain engaged in stormy conference.

When we left the country, storm signals still flew. Unrest and rioting disturbed the capital, reflecting bitter conflicts involving the Shah, the Premier, the army, and the Communists. On the day we sailed into New York Harbor, headlines greeted us with news that military revolt had overthrown Premier Mossadegh, and the young Shah had returned from Rome to reclaim his throne (page 718).

"What was it like to live in Iran during these troubled times?" friends ask us.

"Most of the time quite ordinary," we reply.

We did get caught up in the turbulence on occasion, and vivid memories of the disturbances we witnessed still linger.

Just after we arrived, my husband and I stood on our balcony listening to gunfire. "What have we brought our children into?" we asked each other. Another time a bullet ricocheted over our young son's head as he scampered home through the garden. And I shall not soon forget the experience when my husband and I, riding near Parliament, came suddenly face to face with a terror-stricken mob and saved ourselves only by [illegible] [illegible] [illegible] [illegible] [illegible]

Author Retains Happy Memories

Yet happier memories surge up to blot out the scenes of violence. I remember with special pleasure the subtle humor and lightheartedness of the people; the devotion of our household helpers, Yassaiet and Batul, when all of us took to our beds with several cases of flu; the vividness of a Persian garden; the beauty of blue-tiled doorways, of olive-green minarets, of intricate filigree in the silver shops, the gawky superciliousness of camels filing past Parliament; the brilliance of the skies, obscured only at mealtime by the haze from charcoal fires across the city.

Tehran's sparkling fountains looked unbelievably cool and refreshing that sweltering June day when we arrived with all our possessions. Our 16-day trip overland from Afghanistan had been long, hot, and dirty—the kind that makes one wonder why he ever thought of doing it. Tehran seemed a world apart.*

At the time, we paid scant attention to the nationalization of the oil fields on which the world focused so intently. Our thoughts centered with curiosity on our new environment and job. The American Presbyterian Mission had asked us, a Quaker family, to come to Tehran to help in their school.

School a Babel of Tongues

Originally started for mission children, Community School had quickly grown until it offered American-type education to 500 children who could not easily fit into the Iranian school system. They represented 31 nationalities—a miniature United Nations. Besides the youngsters from the missions and the English-speaking colony, there were children from many embassies, refugees from half a dozen countries, and even Iranians who had special permission from the Ministry of Education to attend a school run by foreigners. Some were children of Iranian officials; one was Premier Mossadegh's grandniece.

The 30-odd teachers used only English in their classes although, like the students, they came from widely varying national and religious backgrounds. Many of our youngsters spoke four or five languages. Within a few moments one day I heard Hebrew, Russian, Armenian, Persian, and English as I passed a handful of boys practicing on the basketball court.

Osborne, my husband, was vice principal of Community School, with many additional tasks as business manager and mathematics teacher. Our daughter Wetherill entered sixth grade, where she soon decided that a Girl Scout looked too childish in waist-length curls and rapidly emerged as quite a young lady, with shorter haircut, longer dresses, and lipstick.

Our son Ds quickly developed an enthusiasm for soccer and was tremendously excited about being in a real fifth grade after two years of classes at home.

* See "American Family in Afghanistan," by Rebecca Shannon Cresson, NATIONAL GEOGRAPHIC MAGAZINE, September, 1953.

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Developing Clients Should Take a Women from Worker's Wards and Men's Stores

[illegible]

A Stick-brandishing Mob Rips Down a Politics Sign in Tehran

[illegible] 1 August last swept Premier Mossadegh from power [illegible] the throng is here directed against headquarters of the [illegible]

As for me, I hurried across the compound each morning to tend [illegible] and serve as substitute teacher if necessary, after dealing with the problems that [illegible] a housekeeper in Iran.

The school provided us with a large and comfortable house so that we might harbor two boarding students from provincial mission stations. The extra [illegible] for we soon had a houseful of pet [illegible] included two ducks, mallard Solih and Black Soul (Morning and Night), and a dog named for Irani's [illegible] although he had no [illegible]

[illegible] of the dignity of Demavend, the 18,934-foot snow-capped cone of the Elburz Mountains north of Tehran.

American Refinements Added

Our rooms, filled with furniture inherited from departing missionaries, seemed very [illegible] in spite of mud walls a yard thick in [illegible] ceilings, tile floors and such [illegible] [illegible] tobacco [illegible]

Like [illegible] the plumbing was [illegible] Iranian. We had semi-American toilets in separate rooms just outside the [illegible] part of the house. They flushed when you threw a pitcherful of water down them, provided [illegible] speed.

[illegible] towel [illegible] bathroom with a [illegible] provided hot water. [illegible]

[illegible] American [illegible] that [illegible] primitive [illegible] produce [illegible]

[illegible] improvement [illegible] [illegible] come after we acquired our Iranian servants. [illegible]

[illegible] Both of her [illegible] had been educated in an American [illegible]

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Iran, the Persia of Old: Famed for Poetry, Rugs, and Oil

Desert wastes cover fully half the high plateau, but fertile regions remaining have long inspired poets and painters. Proud Iran was remember that [illegible] years ago that ancestors subdued most of the known world.

[illegible] old, and a 25-year-old son. Like Yaksabet, she was a Christian, although all her family were Moslems.

Changes in Batül's home during the two years we were in Iran reflected the force of Western influences throughout the country. Batül's elderly mother kept house in old Iranian style when we first knew her, folding away sleeping pads each morning and serving meals on a cloth on the floor. By the time we left she had adopted the use of chairs and tables.

Housekeeping Difficulties

Os enjoyed practicing his Persian lessons at Batül's house in winter. In the living room a pot of charcoal was placed under a low table covered with a quilt. The family sat on the floor around the table with soldiers at their backs, their knees under the quilt and their toes pushed close to the glowing coals. Os liked to join the group with little Mariam, Batül's niece, close by to prompt him as he read his Persian. I suspect that Batül's mother sometimes fed him candies and pistachios.

What I should have done without Yaksabet and Batül I do not know. Housekeeping is doubly difficult when walls are of mud and floors are rough stone, concrete, or tile. A hasty cleaning of house and furniture was often necessary just before guests arrived, for a film of dust soon settled over [illegible]

[illegible] Iran is in a land where parched soil or desert predominates, and a grassy ground cover is lacking in most places except in the lush semitropical country around the Caspian Sea. Lawns are virtually unheard of in Tehran, although every house of any consequence has its carefully tended flower garden surrounding a pool that holds irrigation water used between infrequent rains.

Iranian servants freely voice their opinions. Ours were no exception. Batul, for example, didn't approve of our nightly cup of coffee before retiring, simply because the idea was strange to her. Rather than force the issue, I made a tour of the house each night to assemble the coffee tray—to the kitchen for milk, the study for powdered coffee, and the dining room for cups.

When Batül had her holiday, Yaksabet would sometimes indulge me and prepare the coffee tray before she left after dinner. But in other ways she was very strict with us. If we asked for out-of-season or expensive food, Yaksabet was apt to have a sudden loss of memory.

One day both servants disapproved when I suggested caviar sandwiches for a large tea party. I insisted on them; caviar comes from Iran's Caspian shore and costs only a fraction of its lofty price in the United States.

So I tore off to my scheduled duties in the library, a teachers' meeting, a Scout meeting, a Persian lesson. Back home just in time for the tea, I hastily inspected arrangements. There were caviar sandwiches all right—if you could call them that. Close inspection revealed a few dark specks of caviar smeared across each buttery surface.

[illegible] however, our [illegible] hold helpers took orders most willingly. In polite Iranian fashion the [illegible] [illegible] one hand [illegible] [illegible] Persian [illegible] eye. Thus did he tell us [illegible] politically. Max [illegible] [illegible] if I failed although I [illegible] usage the expression [illegible] merely a polite yes.

Yaksabet did most of our shopping. [illegible] needed more household money, she modestly asked for *kam ejaf* (a little money). If pressed for an exact amount, she would admit to wanting [illegible] from 25 rials [illegible] when we left [illegible] but it was always [illegible] on the first morning.

I tried to persuade [illegible] to buy food for several days at a time. But the habit of daily marketing was too deeply ingrained, and she [illegible] [illegible] a point.

[illegible] she took [illegible] basket [illegible] hours toward the scattered [illegible] would find the vegetable [illegible] [illegible] freshly [illegible] in the warm sunshine.

Much farther on would be sellers of four [illegible] pounds or three, of melons—especially Persian melons of unforgettable flavor; of [illegible] [illegible] and occasionally oranges [illegible] fresh dates, unpackaged, and [illegible] more than now I [illegible] elsewhere; of wild [illegible] [illegible] and spices and [illegible] [illegible]

711

An American Gas in Iran Refuels at a Hand Pump

[illegible] with Aspirgas and Esso wan [illegible] [illegible] pump bote [illegible] for [illegible]

Milkman Rides a Bicycle

Tehran's streets are alive with sellers (page 7161). During summer [illegible] with [illegible] earthen jugs, a glass, and a bit of ice [illegible] cooling drinks on the streets. Others [illegible] corn over charcoal. In winter [illegible] after steaming slices of beetroot and [illegible] the latter being chunks of meat [illegible] dressers. Many cry their wares in a melodious minor key patter.

The milkman came to our house with cans mounted on either side of his rear bicycle wheel (page 7171). If Yaksabet or Batul was not there, we would find a pan in the kitchen and [illegible] our daily supply. His services [illegible] including the stove [illegible] the milk on to boil [illegible] being we never skipped.

Lavash, paper-thin bread, also was brought [illegible] across the rear wheel of a bike. The [illegible] and [illegible] for cereal or toast [illegible] [illegible] day we [illegible]

[illegible] from the market. Yaksabet prepared many a delightful dish. She introduced us to *fesenjan e Mehere*, now my favorite Iranian food: tender fluffy rice buried under a black [illegible] looking stew of pomegranate juice [illegible] and [illegible] fowl. It looks [illegible] but [illegible] [illegible] and [illegible] [illegible]

Along the street called Nader, Western-

Pennsylvania Dutchmen Celebrate the Lunar New Year in the Pilgrim Tradition

[illegible]

[illegible] Everywhere [illegible] the most bargain, for merchants [illegible] naturally ask much more than they expect to get.

[illegible] along one of the [illegible] Dutch [illegible] Wedding [illegible] Mother, [illegible] [illegible] years [illegible] [illegible] do.

Two Techniques in Bargaining

When shopping, We[illegible] usually [illegible] then looked sad if the [illegible] was [illegible]. Or a technique which [illegible] was to grin cheerfully [illegible] the merchant with the word *shaton* (devilish). Both [illegible] well [illegible] both children's [illegible] identified them as not [illegible] to pay higher prices than were the natives.

Shopping expeditions sometimes [illegible] to the [illegible] Old Square [illegible] which [illegible] a [illegible] of brick.

Emerging from narrow shadow [illegible], come the hammer beats of brass and copper smiths and the glow of their tiny forges. In countless [illegible] shops [illegible], tailors [illegible], carpenters [illegible] wood. [illegible]

[illegible] the stock of [illegible] table chosen from a bobbin [illegible] of jewelry or a rug or a bolt of [illegible] material. Each merchant has a small [illegible] if you do not find just what you want [illegible] additional stock from a neighbor [illegible] [illegible] other clerks.

As one threads the [illegible] of the Old Bazaar [illegible] of

[illegible] Photographer J. [illegible]

Scribes Double as Vendors on the Steps of Tehran's Post Office

These [illegible] letters for a price. In a [illegible] they sell stationery [illegible] and other [illegible] with the purchaser's name. The young woman [illegible]

bidding [illegible] and [illegible] at [illegible] up each [illegible] to [illegible] the flow of [illegible] and porters. And it requires a [illegible] persistent [illegible]

Silver merchants sell their wares at every turn. Most of them [illegible] understanding [illegible] silver sells by weight, regardless of the man-hours that have gone into workmanship.

The napkin rings [illegible] to Osborne and me for Christmas were beautifully engraved by a Russian Armenian. We [illegible] the names [illegible] engraved on the rings "Osborne [illegible] Cresson" and "Rebecca [illegible] Cresson." When we received the gift, we found that they were [illegible] Cresson" and "[illegible] Cresson." The craftsman had started from the right and written toward the left, as in Persian calligraphy, so there wasn't enough room to [illegible]

[illegible] the [illegible] Persian [illegible] from the days when [illegible] treasures from other lands.

[illegible] could never understand [illegible]. She [illegible] over many of my selections, saying, "My mother threw that away [illegible]

"Alaska Man" Sells Popsicles

Since time [illegible] Persian clothes have been [illegible]-colored. Within the last several years [illegible]-made suits and dresses have come on the market in Tehran. The [illegible] men and women eagerly seek them because they have the Western touch.

Western influence is [illegible] in other smaller matters. The popsicle man who came to our street was called the "Alaska man." [illegible] a regular [illegible] to yoghurt is "Mickey Mouse," [illegible] with a mouse on the label.

Sun-baked Tehran, House of a Million, Looks Up Envviously at Snowy Elburz Mountains

This aerial view shows the western part of the capital, for the point just north of the city, see Camp Amirabad where Soviet troops were quartered in World War II. Note it boasts a stadium in Indian Clubbery.

Roosevelt, Churchill, and Stalin Met in the Iranian Capital a Decade Ago

[illegible] to mountains in the [illegible] Reza Shah Pahlavi, where [illegible] dark, the capital of [illegible] to [illegible] in the mountains

Porous Jars Cool Water for Parched Throats in Hot and Dusty Tehran

[illegible]

Many of our general possessions revealed much about life and customs of Iran. [illegible] for example, I wear a heavy silver bracelet from which dangle three silver [illegible] lines. Each is carved [illegible] with the elaborate characters of Persian script. They are [illegible] water. I have known government workers in Tehran who carry such [illegible] to their offices and use them as a [illegible] official papers.

[illegible] of Iran's [illegible] might [illegible] women [illegible] their hair with [illegible] As they are Persian [illegible] instead of [illegible] to conceal the white [illegible] the [illegible] black [illegible] with the passage of time [illegible] in the case of Iran's [illegible] nothing [illegible] last.

A little brass bowl [illegible] verses from the Koran [illegible] the lip [illegible] of irregular shape. I was told that in times past, when someone in a household fell ill, a mullah [illegible] was called to the house to fill the bowl with water and recite a prayer for each of the [illegible] The [illegible] was that the prayers passed through the rings into the water, which was then used for [illegible] the sick person.

A [illegible] designed to hold a [illegible] of [illegible] the [illegible]

Well-educated professional people [illegible] told me that a weekly visit to the bath house [illegible] even though [illegible] bathe at home. I suspect that the [illegible] reason for these visits is as much social as hygienic.

Stone Scrubs Elbows and Feet

Women carry elaborate equipment to the baths. Each has towel [illegible] wrapped in a cloth and soap in a [illegible] There [illegible] a bag [illegible] of wood [illegible] which is used while drying [illegible] of cloth with which to tie up the hair after shampooing, and a pleated [illegible] so that the [illegible] A piece

or pumice stone is used for scrubbing elbows and feet, and [illegible] pomegranate rubs the rest of the body clean.

Iran celebrates three Christmases: one on Jan. 25th for Protestants and Catholics, and two in January for Armenians and Russian Orthodox. Thus Christmas trees in Teheran—pines brought from the Caspian—are on sale for what seemed to us an abnormally long time.

March 21 is New Year's day in Iran. Shortly before, many Iranians observe the festival of fire, a survival perhaps of Zoroaster from the ancient Persian religion of Zoroastrianism, whose gods are good and evil. Light Among Moslems, and its name to the modern [illegible] bat.

Servants in our compound laid bundles of straw two feet apart in series of threes. At dark the fires were lighted, and we all went out to jump over the flames with Batul. When children [illegible] [illegible] Mr. [illegible] [illegible] the [illegible] would be destroyed in the flames.

Everyone participates at New Year. Mr. Batul's ten on our first New Year [illegible] and helped ourselves to numerous [illegible] of nuts, candies, cookies, and squash seeds. Perfume was sprinkled on our hands, and we rubbed it on our hair as a gracious gesture. As at all Iranian [illegible] [illegible] we drank cup after cup of tea.

While there we [illegible] a few [illegible] of Mariam's Persian first reader and [illegible] that Ms could add Persian numbers. He was [illegible] first on the Iranian abacus, getting answers faster than his father could add in his head.

The Shiite sect of Islam, to which most Iranians belong, [illegible] reverses three [illegible] the Prophet. Ali, his [illegible] and Hussein and Hassan, his [illegible]. All three are recognized by the Shiites as the [illegible] to Mohammed in the leadership of Islam. The month of Muharram is a period of mourning for the Shiite martyrs. Flagellants, both men and boys, parade [illegible] the streets, carrying banners and [illegible] [illegible] were [illegible].

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A Cycling Dairyman Ladles Milk for Yaksabet the Cook

When the squeak of his horn did not bring Yaksabet or Batul to the door, this milkman entered the author's kitchen, filled a pan, [illegible]

These religious celebrations reach their climax on the tenth of Muharram, the day Hussein was killed in battle. At the [illegible] of the month [illegible] [illegible] his [illegible]. [illegible] we heard [illegible] past our walls far into our night, and the mournful chant "Hussein! Hussein! Hussein!" came [illegible].

Chant of the Bricklayer

Persia is a land of poets. Even [illegible] speaks fondly of [illegible] perhaps because the [illegible] of their poets far [illegible] people know Shakespeare.

I saw this illustrated particularly well when a [illegible] school ran adjacent an old hospital. All day long I listened while the masons built their walls. The [illegible] chanted:

[illegible]
[illegible]
[illegible]
[illegible]

At the last word in each line an [illegible] on the ground tossed up a brick. As [illegible] bricks were flying 15 feet or more to [illegible]

Iran's Shah, Returning from Real Pahlavi Salutes an Honor Guard at Tehran Airport

[illegible]

dence of this ancient quatrain. Thus do Persian workmen impart a measure of beauty into the most mundane tasks.

Reverence for such great Persian poets as Omar Khayyam and Saadi is expressed in magnificent tombs. In Tehran, as in other Iranian cities, streets bear the names of these beloved writers.

Real Flavor Found Outside Tehran

Tehran with avenues and new buildings [illegible] be extensive [illegible] Reza Shah Pahlavi [illegible] the present Shah. These improvements, together with the presence of refugees who have flooded in from Afghanistan, Asiatic Russia, [illegible] even Europe, give the capital a cosmopolitan atmosphere unlike most other parts of the country.

For the real flavor of old Persia we went elsewhere. At Bisotun, at the base of Kuh-e-Mozafar (Kuh-e-Mozafar, 7[illegible] feet), southwest of Tehran, the scenery is [illegible] [illegible] There [illegible] we heard the hoofbeats of [illegible] warriors and the marching bowmen of Cyrus the Great, of Darius the First and of Xerxes, who made Persia a world empire two and a half millennums ago.

There we surveyed the ruins of the citadel and the fabled city of Ecbatana with its seven concentric walls, one covered and one [illegible] of Lake Urmia remain [illegible] of those which more adventure [illegible] Tiger looks much like a lion, women have muffled the head into an expressionless blob in hopes that pleas for children might be answered (opposite).

By an ancient trade route near Hamadan, we saw inscriptions carved in living rock by both Darius and Xerxes, each proclaiming himself to be "King of the Great Earth, even to far." The trilingual inscriptions, in the Old Persian, Elamitic, and Babylonian languages, proved at the time helpful decipher many other cuneiform writings.

At Rai (Rhages), on the barren plain

Hamadan's Disfigured Lion Guarded the Gates of Ecbatana Long Ago

[illegible]

south of Tehran we visited Rayy, where the [illegible] tomb [illegible] after the time of Alexander the Great and destroyed by Genghis Khan. There we [illegible] of [illegible] [illegible] [illegible] tower of Silence where Zoroastrian [illegible] used to leave their dead [illegible] to the vultures, until the practice was [illegible] by Reza Shah. The [illegible] [illegible] [illegible] with [illegible] [illegible] [illegible] [illegible] [illegible] ends.

On the way home from Rayy we passed rows of [illegible] houses where [illegible] [illegible] out of [illegible] by the light of lamps. Some [illegible] had [illegible] themselves in [illegible] or shawls, preparing to sleep [illegible] completely covered in spite of the warm night.

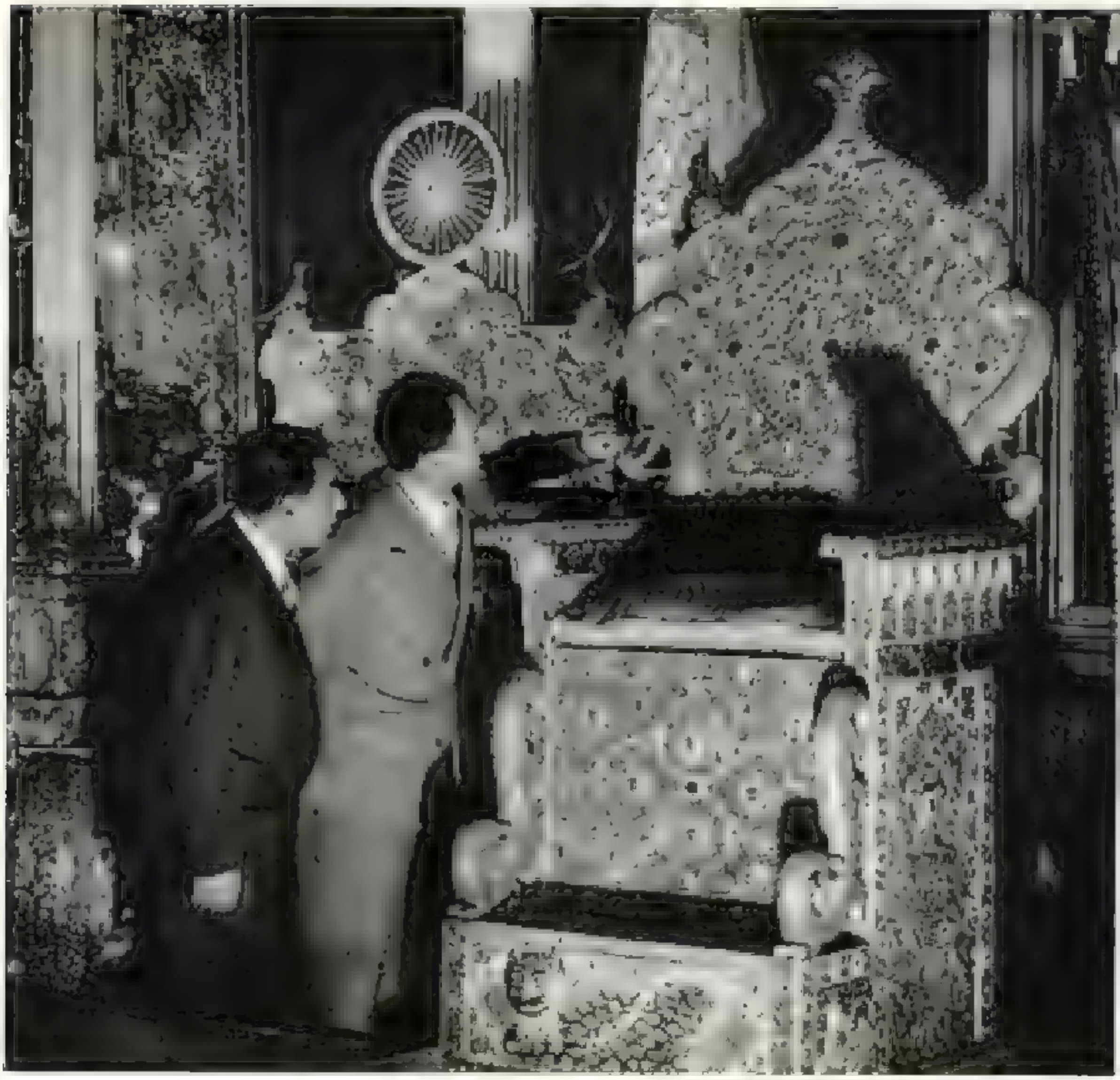
Communists at the Back Door

Peace House, a Communist youth club and propaganda center almost at our back door, kept us constantly aware of the activities of Soviet agents in this [illegible] land. [illegible] party [illegible] the place. Hostile students [illegible] both [illegible] and Red agents [illegible] from the [illegible] propaganda [illegible] and [illegible] military vehicles.

We often knew in advance when riots were coming, for they usually accompanied previously announced Communist meetings. These disturbances were [illegible] local [illegible], especially in the vicinity of Parliament or the University. And they kept to a regular [illegible]. Disturbances stopped at noon for lunch and siesta, beginning again about 4 or 5 o'clock. By nightfall [illegible] were deserted [illegible].

Sometimes we would see store fronts shuttered [illegible] merchants [illegible] going with [illegible] the street for [illegible].

In our own neighborhood [illegible] riots [illegible] after [illegible]. Marchers crowded the streets [illegible] carried [illegible] banners and loudspeakers [illegible] [illegible]



Massive Gems Worth Millions Stud These Successors to the Peacock Throne

[illegible]

morning to call the faithful to prayer; [illegible] prayers for the dead and verses from the Koran.

So we lived in Tehran amid a certain amount of unrest, cognizant at times of martial law and curfews. But in daily our lives were reasonably [illegible] behind the walls of our compound. The political disturbances had little direct effect on us.

It was the same with the earthquake which destroyed a village only [illegible] miles from Tehran. Newspapers in the United States said Tehran itself had been badly shaken. My mother wrote, "I realize you've been through difficult times."

We laughed when we got that message, for none of us knew there had been an earthquake except Coleman, who had happened to look up and noticed the picture over his desk swinging back and forth.

The Iranians say that the world is poised between the horns of a cow, and that when the cow gets tired and shakes her head, the earth quakes.

Tehran's snow was as heavy as it [illegible] people when we lived in suburban Brook-

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To carry out the purposes for which it was founded sixty-five years ago, the National Geographic Society publishes [illegible] [illegible] invested in The Magazine itself or expended directly to promote geographic knowledge.

Articles and photographs are desired. [illegible] Magazine uses, generous remuneration is made.

[illegible] constantly being made. The Society has sponsored more than 1[illegible] scientific expeditions, some of which required years of field work to achieve their objectives.

The Society's notable expeditions have pushed back the historic horizons of the southwestern United States to a period [illegible] vast communal dwellings in that region. The Society's researches solved secrets that had puzzled historians for 300 years.

[illegible] January 16, 1939, discovered the oldest dated work of man in [illegible] 200 years and the stone dated in [illegible] center of early American culture, previously unknown.

November 11, 1935, the stratosphere flight of the world's largest balloon, Explorer II, sponsored by The Society and the U. S. Army Air Corps, reached a world-record altitude of 72,395 feet. Capts. Albert W. Stevens and Orvil A. Anderson took [illegible]

[illegible] history of astronomy was [illegible] and Palomar Observatory of [illegible] of Technology. This project will [illegible] space and provide [illegible] to study the [illegible] Pueblo in the Aleutians.

[illegible]

[illegible]

[illegible] one of the world's largest icefields and glacial systems outside the polar regions was discovered in Alaska and Yukon by Bradford Washburn while exploring for The Society and the Harvard Institute of Exploration, 1935.

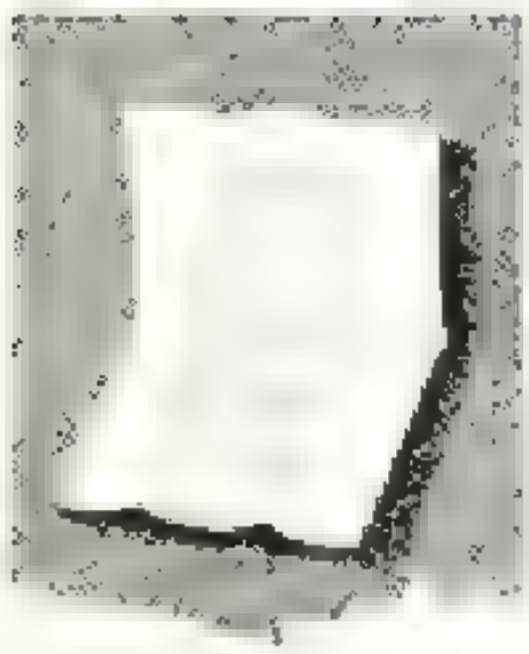
EXECUTIVE STAFF OF NATIONAL GEOGRAPHIC MAGAZINE

GILBERT GROSVENOR, EDITOR

JOHN OLIVER LA GORCE, ASSOCIATE EDITOR

[illegible]

"DEAR SIRS: By 1960 please send me these items..."



The facts in this letter are not imaginary. They are a sum up what economists predict for the United States by 1960.

To American Industries
Dear Sirs

By 1960, please arrange to be making thirty per cent more goods than you make for me in 1950.

I expect a growth of about twenty million people in my family, the same as in the past decade. Part of my order is because of them. Part is to increase my standard of living.

If possible, arrange more leisure time for me. I do not wish to work longer hours to pay for increased purchases.

You will, of course, find me new products better than the old. You have done this in the past, but please increase your efforts.

Please tell the electrical manufacturers to be making 2 times as much by 1960. I am increasing particularly my purchases from them.

Very truly yours,
(*signed*) The American Public

What this letter calls for is clearly understood by any company or industry that has earned public good will and hopes to keep it.

Here are three moves that General Electric is accordingly making.

First, if production and leisure are to increase at the same time, the nation's skilled man power must be used with increased effectiveness. To help create more goods to meet America's needs, General Electric is in the middle of a billion-dollar expansion program.

Second, products now on sale must *do* more if people are to get more for their money. Examples may help here. Engineers at General Electric have multiplied the efficiency of turbines, the light from lamps, the power of x-rays, and so on. Such engineering is and must be an always expanding program.

Third, new products must be found to make known products obsolete by comparison. To find new truths, research in America must increase. At General Electric, new research facilities and people are being added.

Here are some fields where scientists say new discoveries could make a big difference to all of us . . . ways to convert atomic energy into useful power . . . ways to store heat for later use . . . ways to create light from now invisible infrared rays . . . "fuel cells" to convert energy of gaseous combustion directly into electricity . . . new metals to stand higher heat (for jet engines and turbines).

October 15th marks General Electric's 75th anniversary. We start the next 75 years with greater experience, more capacity and, we hope, more efficient planning. We hesitate to look back over our shoulders at what has been developed: modern x-ray, electrically driven trains and ships, the tungsten lamp, the fluorescent lamp and such—for we are convinced that the finding of the future will be even more significant.

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TDC ACCESSORIES ADD TO THE FUN!

TDC PRESTOMOUNT Slide Mounting [illegible] $1.85

TDC SELECTRAYS [illegible] $1.00 [illegible] $1.50

TDC LUMITROL Variable [illegible] $10.00 [illegible] Too high. —All prices Subject to change without notice.

TDC SELECTRON CHANGERS [illegible]

TDC SELECTRAYS [illegible]

TDC SLIDE PROJECTORS [illegible]

THREE DIMENSION COMPANY

3512 N. Kostner, Chicago 41, Illinois

FREE FAMOUS BOOKLET

Shows how to make better [illegible]

THREE DIMENSION COMPANY
Dept. HG11
3512 N. Kostner, Chicago 41, Ill.

Please rush me Free booklet [illegible] Bar Arnold A.P.S.A. [illegible] books.

Name [illegible]

Address [illegible]

City [illegible] Zone [illegible] State [illegible]

TDC's New STEREO Projector-View [illegible] $149.50*

TDC STEREO-VIVID— [illegible] $175.00*

TDC STREAMLINER "500"—[illegible] $84.50*

Member of National Association [illegible]

El Mirador in Palm Springs [illegible] hotel [illegible] hotel [illegible] famous desert. Many of its guests enjoy Hertz Rent-A-Car Service.

[illegible]

RENT A NEW CAR FROM
HERTZ
...drive it as your own

HERTZ SERVICE: what it is, what it costs, how to get it . . .

What It Is . . . Hertz is a rent-a-car service, international in scope, available in more than 500 [illegible] throughout the United States, Canada, Alaska, Hawaii, the Virgin Islands, Cuba, Haiti, Mexico, Great Britain, Ireland and Switzerland.

What It Costs . . . Here is a specific rate example: at the Hertz station in Palm Springs, Calif., the 24-hour daily rate is $7.00 plus 8 cents per mile, including gasoline, oil and insurance. Thus, the total cost for a trip of 40 miles in any one day is only $9.40 whether one person or five ride in the car. Rates are lower by the week. Rates vary slightly in different localities of the country.

Gasoline, Oil, Insurance Furnished . . . Even on long trips, whatever amount you pay for additional gasoline [illegible] refunded to you. Also Public Liability, Property Damage, Fire and Theft Insurance and $100.00 deductible collision protection are included in the low rates at no extra cost.

How To Get It . . . It's as easy as A-B-C to rent from Hertz: (A) look in your telephone directory under "H" for your nearest station; (B) show your driver's license at the station and identify yourself; (C) hop into a fine new car and go!

Advance Reservations . . . To be sure of a car when you need it, locally or in some other city, it pays to make a reservation in advance. Any Hertz station will make a reservation for you, anywhere, for any time. Or, if you have the correct Hertz station name and address at your destination city, you can make your own reservation by letter, telegram or telephone. Also, your railroad or airline reservation office will make a Hertz reservation for you through the Hertz Rail-Auto Plan or the Hertz Plane-Auto Plan at the time you purchase your train or plane ticket. Always insist on Hertz when you make your reservation and be sure you get Hertz service when you arrive at your destination.

New Model Cars . . . Cars rented from Hertz are always current model cars of popular makes. The car you rent bears no Hertz identification—it is your private car, for an hour, a day or as long as you wish.

Charge Cards Available . . . Hertz International Charge Cards are issued to well rated business firms and individuals. The card serves as identification, eliminates deposit requirements, and provides credit privileges if desired. These same privileges are accorded to Air Travel Card and Bank Credit Card holders.

Additional Information . . . For information on Hertz stations—anywhere—or for information on any detail of Hertz Service operations, contact your nearest Hertz station or write or phone Hertz Rent-A-Car System, Department 81, 218 South Wabash Avenue, Chicago 4, Illinois, phone WEbster 9-5165.

Look in your telephone directory under "H" for your nearest Hertz station

HERTZ *Rent-A-Car* **SYSTEM**

WHEREVER YOU GO . . . WHATEVER YOU DO . . . YOU CAN RENT A NEW CAR FROM HERTZ AS EASY AS A B C

Happy Family Circle!

This "ring-around-the-family" is the happiest hobby in millions of American homes. Father and son (and daughter, too) team up as engineers of the world's most famous railroad — LIONEL! They send those real life trains hurtling around the track with all the extra speed and power of Lionel's exclusive *Magne-Traction*. And it's a — for Mom, too. She knows everything is running smoothly for Family and Lionel Trains

SPECIAL BIG-3 OFFER! ALL FOR ONLY 50¢ postpaid

NEW TRACK LAYOUT PRINTING KIT PLUS SET OF EIGHT FULL-COLOR BILLBOARDS WITH THE NEW 1953 LIONEL CATALOG...

40 PAGES IN FULL COLOR!

LIONEL TRAINS, P.O. Box 8 Dept. [illegible], New York 40, N.Y.

[illegible] Coupon offer above for Free Catalog only

Name . . . . . .

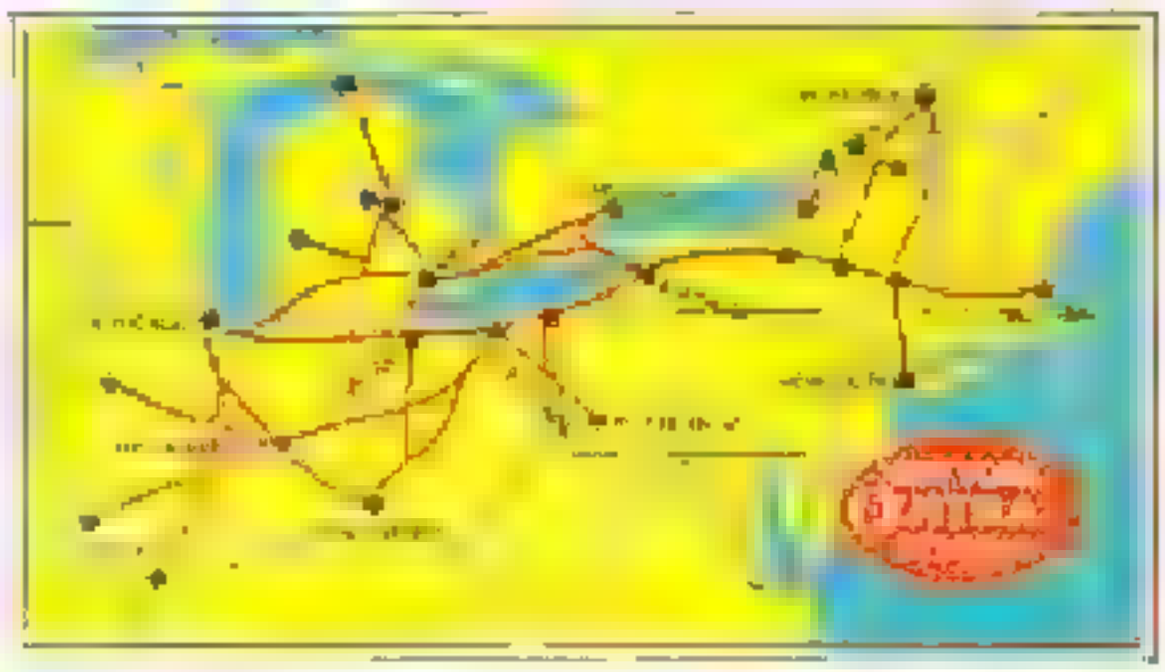
Address . . . . . .

City . . . . . Zone . . . State . . . .

One by one, the windows close their eyes

. . . for a wonderful Water Level Route sleep

Nighttime on New York Central. Long ago, the last leisurely dining car patron pushed back his chair with a contented sigh. Only [illegible] still cast eyes to freshpoints in the club car. One by one, shades were drawn and lights dimmed as this great [illegible] sped along smooth, low level valleys. The guests, in their stateroom private rooms, retired off to slumberland . . . with a drowsy comfort and [illegible] own sense of [illegible] weather security or skyway or railway can match.



GOING ON A WAY? [illegible] you'll find New York Central [illegible] to make [illegible] go [illegible] your way.

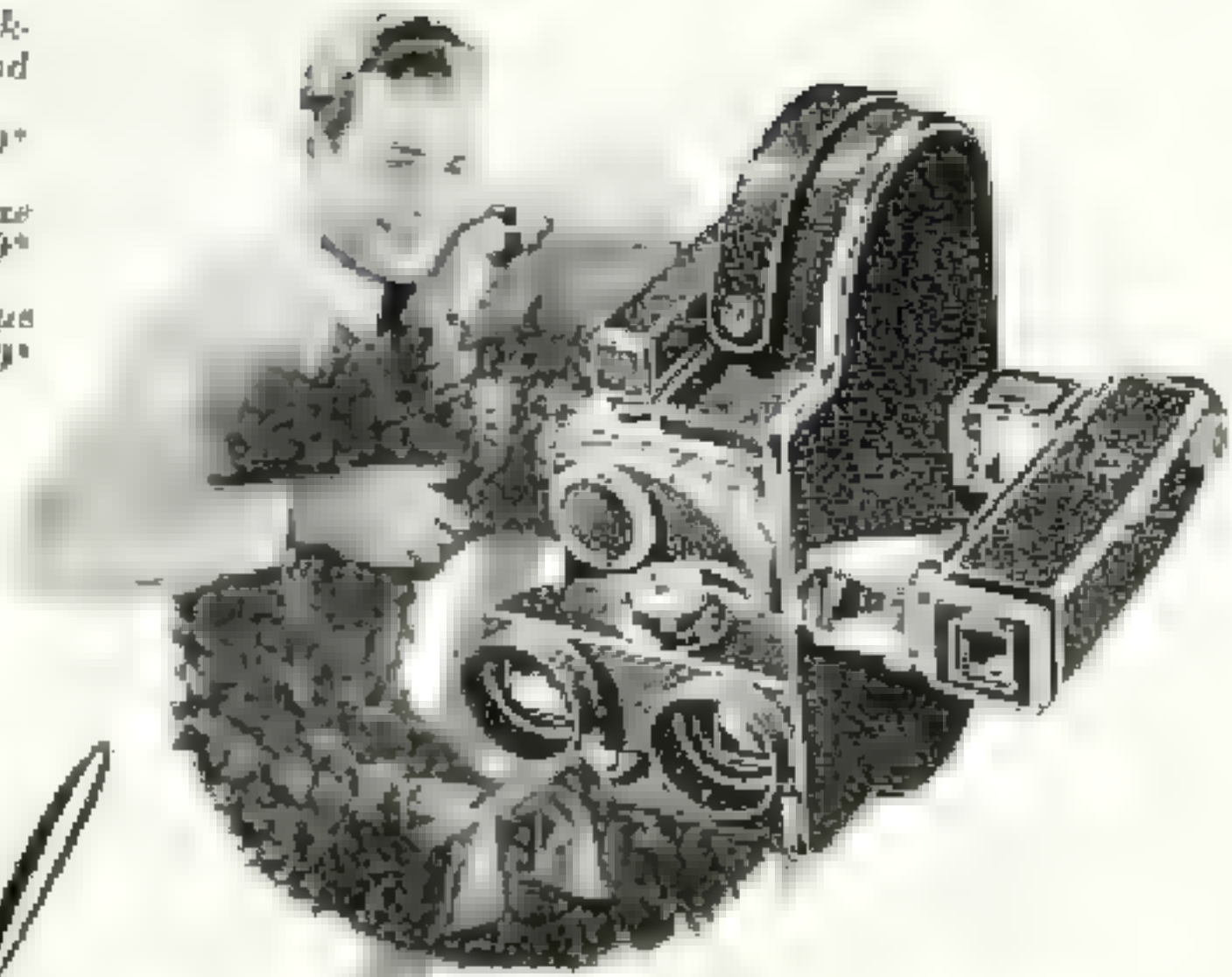
New York Central

[illegible]

The Bolex Stereo System includes taking and projecting lenses, screen, and two pairs of Polaroid glasses.
*$197.50**

Complete with Bolex H-16 DeLuxe camera.
*$715.50**

Stereo Close-up device permits true stereo close-ups.
*$67.50**



3d or 2d Movies for Christmas? Bolex offers both

No matter who it is you're camera shopping for, Bolex is the surest-to-please camera you can give. Is it someone who wants thrilling 3-D today? Bolex brings it to them with Hollywood quality.

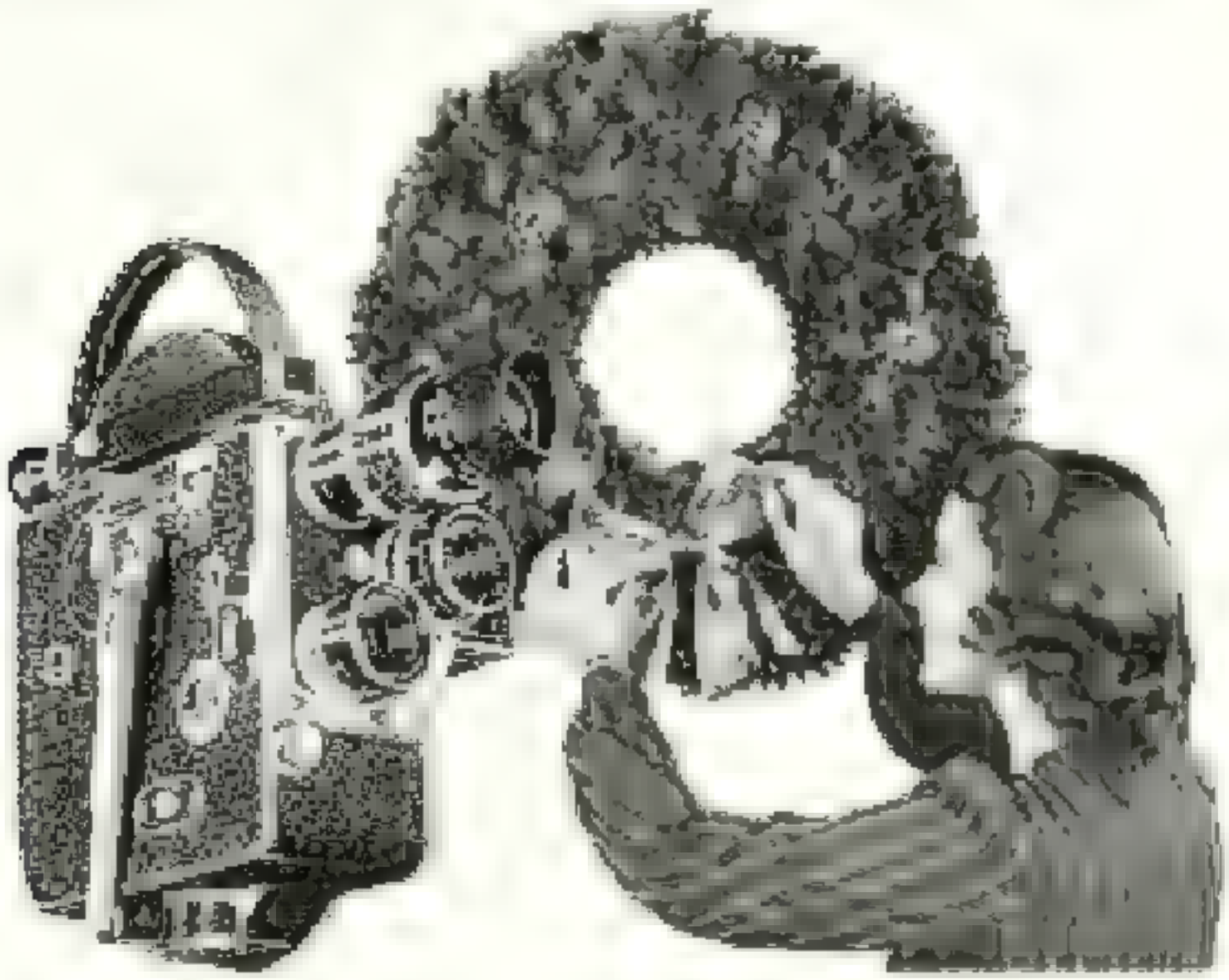
Is it someone who wants the ultimate in 2-D now, with easy conversion to 3-D later on? Again, give Bolex.

Give Bolex and you give such appreciated features as automatic threading, full eye-level focusing, unlimited forward and reverse hand winding . . . all of them *Bolex exclusives*, every one. They've made Bolex the camera most wanted by serious movie-makers. They've helped Bolex win 1953's top filming awards around the world. They'll rate you as No. 1 Santa with anyone who's hoping for a camera!

Bolex owners . . . receive regular free mailings of Bolex Reporter by registering serial numbers. Offer applies only to residents of U.S.A. Overseas subscriptions, $3.00 for four issues.

Paillard Products, Inc., 100 Sixth Ave., New York 13, N. Y.
Outside U. S. A. write to Paillard, S. A., Ste. Croix, Switzerland.

Enjoy the finest in 16mm Movie Making with Bolex®



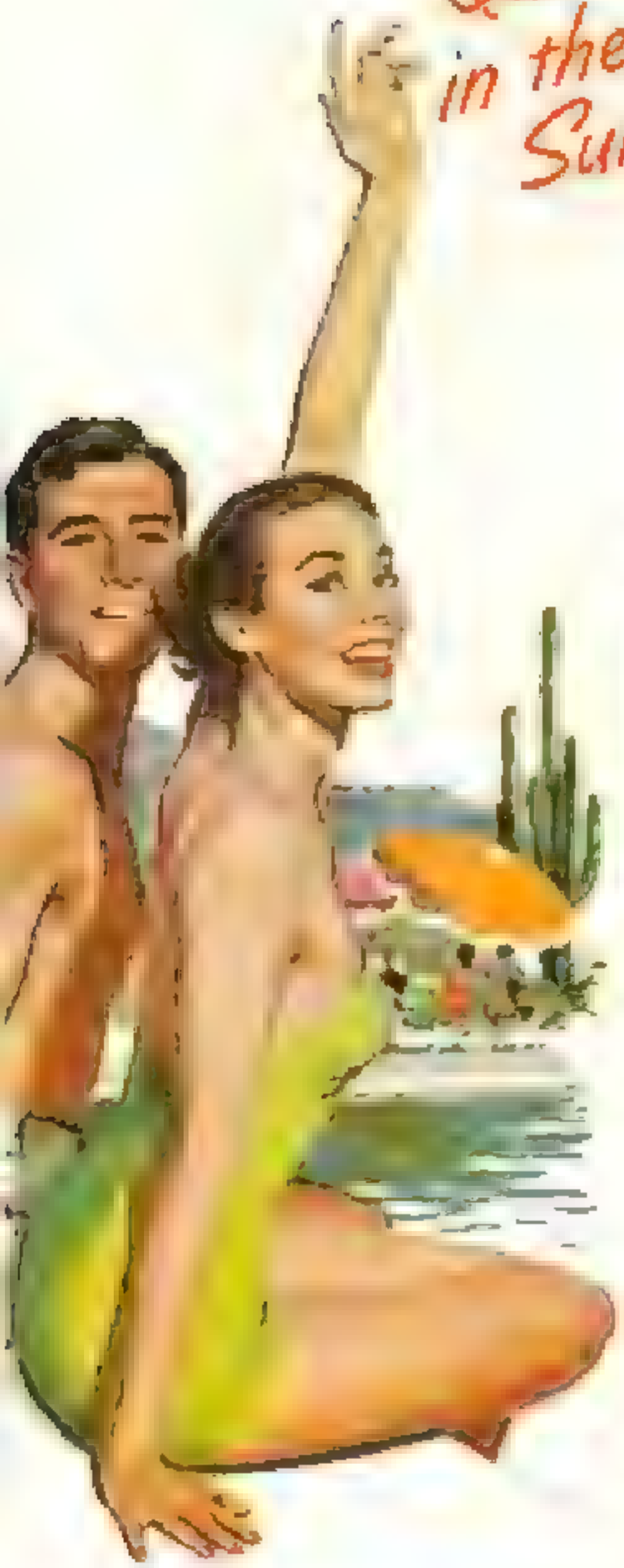
*Bolex H-16 DeLuxe camera. Optimeter finder gives automatic field of view for all lenses from 16mm to 6" telephoto. Eye level focus, automatic threading, footage counter, audible footage, "C" mount turret. With Switar 25mm F/1.4 Kern lens $496.50**

*includes F. E. T.

Mention the Kodascope Magazine—It identifies you.

We're enjoying days of fun and rest on a

Glorious Quickie Vacation in the Southwest Sun Country



We didn't think we could spare the time or money until we put our plans in TWA's hands

Typical examples of TWA fares to Phoenix, Arizona

Fly the finest . . . **FLY TWA**

TRANS WORLD AIRLINES

You're smarter than most businessmen

IF YOU GET 4 OR MORE RIGHT ANSWERS IN THIS IMPORTANT QUIZ

1. How often is there a fire in the United States?

☐ a. Every [illegible]
☐ b. [illegible]
☐ c. Every 11 minutes

2. How many firms that lose their accounts receivable and other records in a fire go out of business?

☐ a. [illegible]
☐ b. [illegible]
☐ c. 43 out of 100

3. How much protection is a fireproof building against destruction of business records?

☐ a. [illegible] can do in a garage
☐ b. Simply walls in an office [illegible] bottom
☐ c. Complete protection

4. How "safe" are most safes that doesn't bear the Underwriters Laboratories, Inc. seal?

☐ a. Completely safe
☐ b. [illegible]
☐ c. [illegible]

5. What do you have to do to get fast fully on fire insurance?

☐ a. Simply phone your insurance agent
☐ b. Prepare a "[illegible]" [illegible]
☐ c. [illegible] records

6. What is [illegible] to get the MOSLER Record Safe—the safe that means the world's best protection?

☐ a. [illegible]
☐ b. [illegible]
☐ c. [illegible]

For [illegible], [illegible] page [illegible] down. [illegible]

Did some of the "right answers" surprise you? They are facts you should know. They could very well prevent your having to find excuses for yourself—or for someone else—after a fire.

* * *

It's better to seek your responsibility squarely in the face, isn't it—and take the steps that will make sure your company stays in business in case of an office fire. Remember—43 out of 100 firms that lose their business records in a fire go out of business. *Don't take that risk. For yourself. Or your company.*

Find out how little it costs to provide the world's best protection for your records—with a Mosler "A" Label record safe. See it. See the new modern styling that makes it a handsome addition to any office.

Check the new, or diamond Mosler convenience and security features, too, including the famous "Counter Step" lock. You'll know why, today, Mosler Safes are more than ever the largest selling record safes in the world. Consult classified telephone directory for name of your Mosler dealer, or mail coupon for FREE FIRE DANGERoter, today.

FREE! FIRE DANGERoter [illegible] FREE! [illegible]

FOR MORE ... IT'S SAFE

Mosler Safe [illegible]

[illegible]

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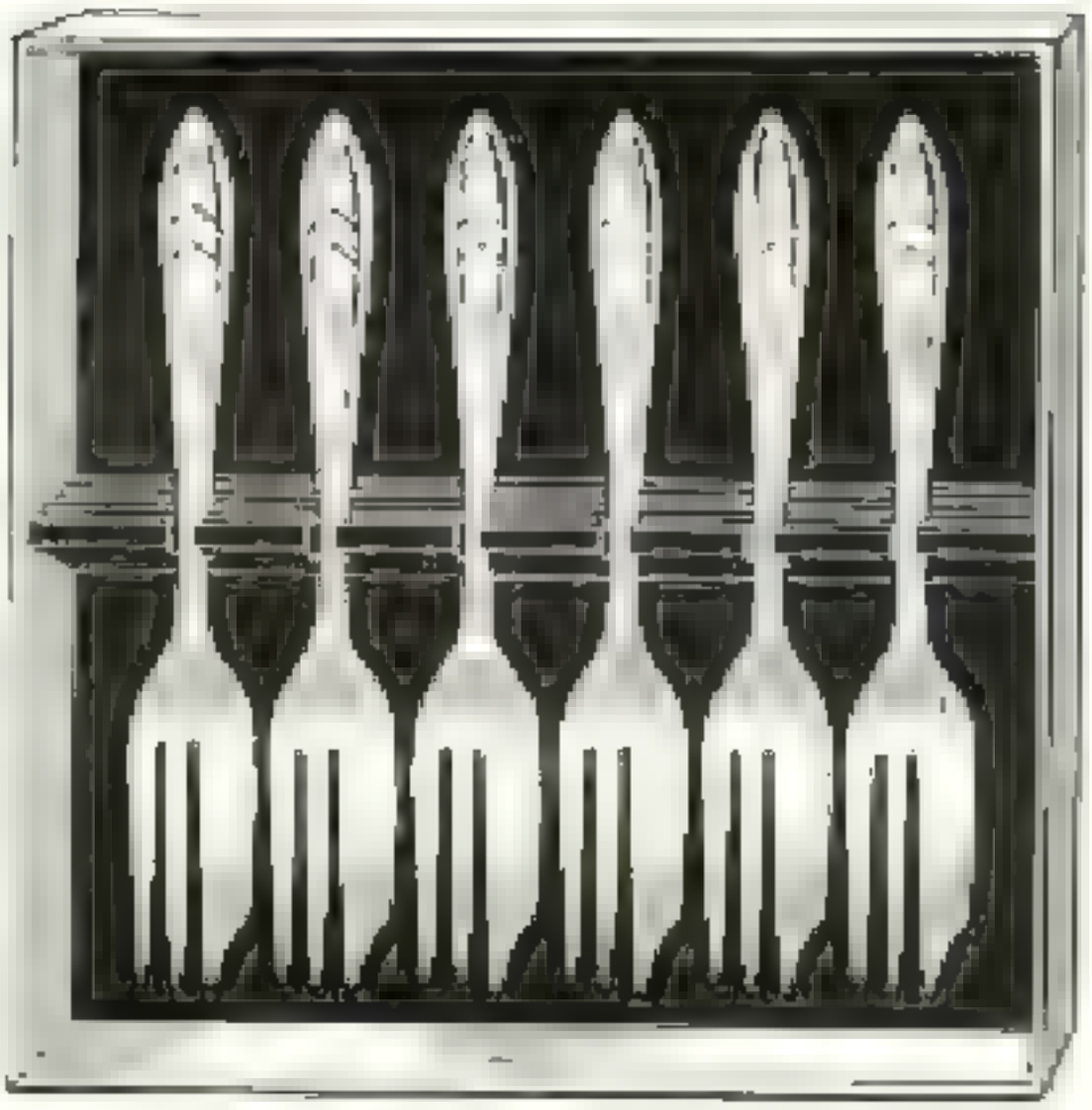
[illegible]

[illegible]

[illegible]



Yours without charge

—SENT DIRECT FROM SHEFFIELD, ENGLAND

THIS EXQUISITE 6-PIECE PASTRY FORK SETTING

IF YOU JOIN THE AROUND-THE-WORLD SHOPPERS CLUB NOW!

T[illegible] the [illegible] and [illegible] of the Around-the-World Shoppers Club [illegible] from abroad we want to send you this beautiful 6-piece nickel silver Pastry Fork Setting, with our compliments if you join the Club now!

This is the famous [illegible] of the most [illegible] of Sheffield, [illegible] members receive every month for only $[illegible] each, postpaid, duty free.

Imagine yourself shopping in the [illegible] of Europe, [illegible] Africa, South America, the Near East and the Far East [illegible] selecting [illegible] interest [illegible] beauty and value and having them sent to you for only $[illegible] each.

[illegible]

Conversation Pieces From Abroad

[illegible] when [illegible] or [illegible] America.

With each package will come the [illegible]

A Thrilling Surprise Each Month

Think of the fun of receiving [illegible] when you [illegible] delightful [illegible]

Membership Costs Nothing

There are no membership fees or dues. You pay only the regular [illegible]

[illegible] which is subject to [illegible] and cannot be prepaid.

You May Cancel At Any Time

[illegible] refund [illegible]

Extra Reward For Joining Now!

[illegible] membership [illegible] you can have the [illegible] from [illegible] the [illegible] the membership form [illegible] single shipment.

A WONDERFUL GIFT FOR SOMEONE!

[illegible]

AROUND-THE-WORLD SHOPPERS CLUB, 71 Concord St., Newark 5, N.J.

READ WHAT MEMBERS SAY ABOUT THE CLUB

"I have enjoyed [illegible]"

[illegible]

"The [illegible]"

[illegible]

Around-the-World Shoppers Club, Dept. 733

71 Concord St., Newark 5, N. J.

Please enroll me as a Member and send me my [illegible] from Sheffield [illegible] membership.

☐ 3 Months	$ [illegible]	[illegible]
☐ 6 Months	[illegible]	
☐ 12 Months	[illegible]	[illegible]

Name ______________________________

Address ______________________________

City & Zone ______________ State ______

[illegible]

GIVE GRACE TO YOUR GIVING
GAIETY TO YOUR GREETINGS

with Crane's Fine Papers and Crane's Christmas Notes. [illegible] the [illegible] expressive [illegible] exquisite texture . . . smartly styled . . . beautifully boxed. For your own greetings . . . enjoy the gaiety of Crane's Christmas Notes . . . richly stamped in reds, greens, golds from exclusive designs. Now ready for the pleasure of you at the [illegible] leading stationers and stores.

Crane's FINE PAPERS [illegible]

► THERE ARE three beautiful, *beautiful* books on the page at the right. They have been [illegible] for seven years. They are the world's beautiful books, they are also *famous* books. They are [illegible] of three of the greatest painters that ever lived. One is Irving Stone's classic story about Vincent Van Gogh, *Lust for Life*. The second is Hendrik Van Loon's classic story about Rembrandt, *R. R.—The Life and Times of Rembrandt van Rijn*. The third is Dmitri Merezhkovsky's classic life of Leonardo, *The Romance of Leonardo da Vinci*.

These famous [illegible] are profusely illustrated *from the works of the painters themselves!* The illustrations are arranged so that they appear at the proper points in the story of the painter's lives, and they are wonderfully reproduced [illegible] by three different processes!

These are the collectors who have been advertising widely for months in search of these books, will now be happy to learn that we are planning new printings of all three. These will soon be on sale in the shops for $12.95 per set.

But there is a special reason why this news will make you happy now. For a copy of each book is going to be given to each new member of The Heritage Club, in the [illegible] of Bonus Books, in the [illegible] of which, even a limited number of Trial Memberships are being [illegible].

Yes, we will give you complete sets of these three beautiful *famous* books — if you obtain a Trial Membership in The Heritage Club at this time. Why?

► Why? In the first place, we have persuaded the milk [illegible] producing our fine papers to increase their allotment to us. With the result that, in six of our recent publications, we have [illegible] from the printers about a thousand extra copies. So we have decided to take on one thousand new members — to offer the Club for just six months.

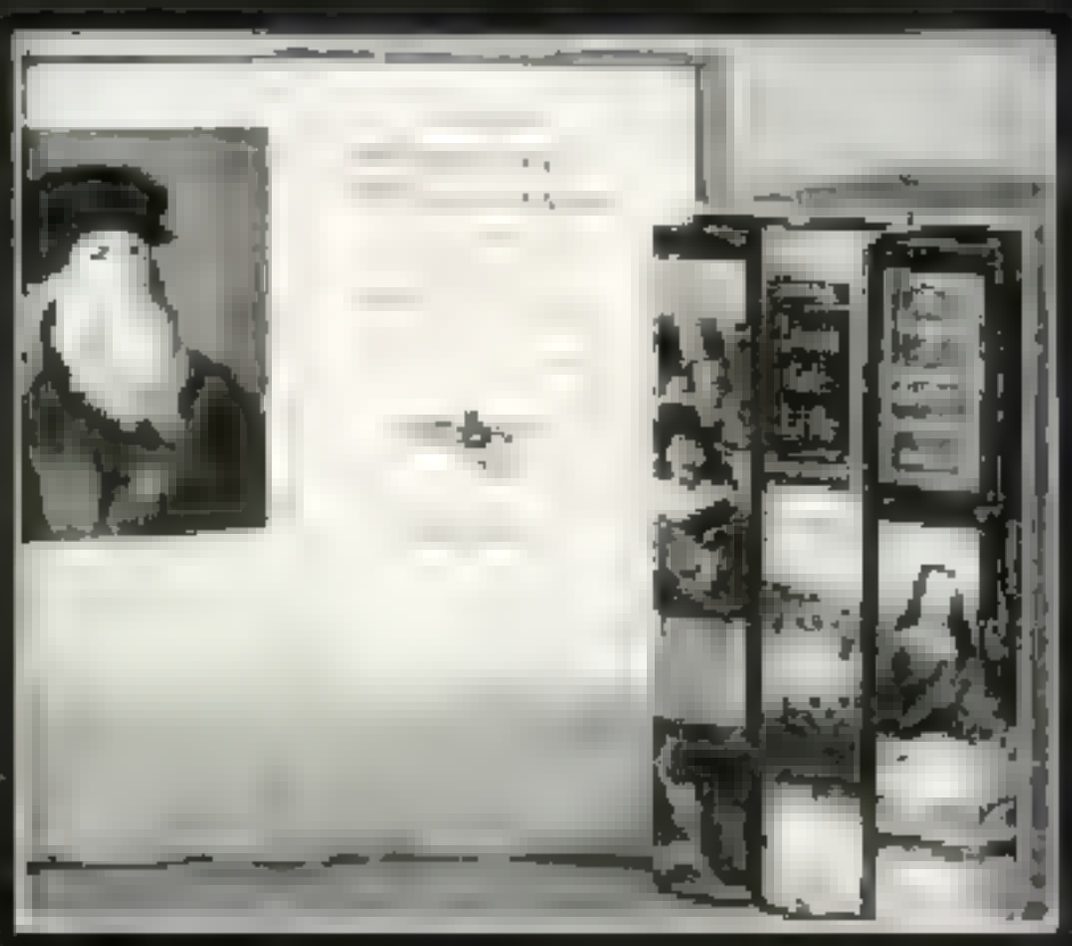
And, in the second place, we want to reward the limited number of people with an even more limited expenditure — by offering this present the enjoyment of you to become one of these new members. For if you do, you will not only obtain these [illegible] copies of the three "illustrated autographs" [illegible] during the coming six months, six beautiful, *beautiful* books — at the same price as ordinary [illegible] fiction.

► YOU WILL OBTAIN a copy of *The Complete Andersen*, all of Hans Christian Andersen's 168 stories in one enormous volume, translated by Jean Hersholt and illustrated in color by Fritz Kredel; and *The Book of Job* with the wonderful miniature paintings by Arthur Szyk; and *The Diary of Samuel Pepys*, the First and Second Series in one volume; and *Nicholas Nickleby* by Charles Dickens, profusely illustrated by Steven Spurrier; and *The Georgics of Virgil* with woodcut engravings by Boris Artzybasheff; and the great Dutch book, Erasmus' *Praise of Folly*, actually printed in Holland!

Any [illegible] of these books would not interest you, you may choose substitutes out of a long list of other Heritage books in print. Later, after the trial period, you can [illegible] whether you want to continue your membership. Obviously, we think you will!

► FOR THE MEMBERS of The Heritage Club obtain these "classics which are our heritage from the past" volumes which will be the heritage of the future. Yet each of these books costs each member only $4.95 or only $4.28 if payment is made in advance!

A Prospectus is now ready. You are invited to send for a copy. Once of the remaining Trial Memberships will then be reserved for you — and you will receive a complete set of the three Bonus Books. Never in the history of book publishing has a greater bargain been offered to new members of books. The coupon printed here enables you to put this statement to the test.



ALL THREE

of these beautiful,

beautiful

books will be yours

FREE

if you obtain a Trial Membership

in The Heritage Club at this time!

RESERVATION COUPON

TO

THE

HERITAGE

CLUB

[illegible]

[illegible]

New York [illegible]

Please send me a copy of the Prospectus describing the limited number of Trial Memberships which are still [illegible] at this time. I understand that you will reserve one for me, and that I am entitled to a complete set of the Bonus Books, without cost, when I send my application.

NAME [illegible]

ADDRESS

[illegible]

"We've retired to a life of ease with our MOBILE HOME in Florida!"

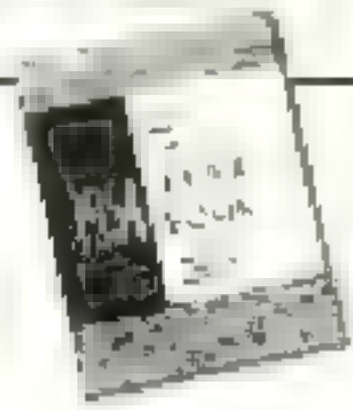
[illegible] FREDERICK J. ROEHS [illegible]

WITH SHUFFLEBOARD COURTS, [illegible]

COVERED PATIOS [illegible]

Priced from $2000 to $6000

[illegible] MHMA [illegible] of the Mobile Home Manufacturers Association [illegible] pioneering improved designs, founding dependable [illegible]



FREE NEW BOOK

[illegible]

[illegible]

"LAST YEAR," says Mrs. Roehs, "we visited friends in a trailer park, and I saw how easy and comfortable their way of life was, and what interesting, friendly people their trailerist neighbors were. From that day on I wanted a mobile home." And Maj. Roehs says, "I wanted to see more of America after I retired from the Air Force. This way we can go where we like and always be at home with our own things."

More and more couples find that they are able to retire younger because of the economy of mobile living. Modern MHMA mobile homes and well-equipped, landscaped trailer parks around the country give them complete comfort in beautiful surroundings.

THE ROEHS' HANDSOMELY FURNISHED LIVING ROOM [illegible] and bedroom. Couch unfolds into double bed, [illegible] from rear of couch. Rear bedroom [illegible] bed, built-in drawer and closet. Couch [illegible] throughout, has automatic heat. MHMA mobile homes are designed [illegible]

"MY KITCHEN IS MORE MODERN than [illegible] other kitchens I've ever had," says Mrs. Roehs. "And everything is right at my fingertips." Kitchen has stainless steel sink with [illegible] stove [illegible] electric refrigerator. Bathrooms in MHMA coaches are complete with wash [illegible] tub or shower.

Mobile Homes Manufacturers Assn.

formerly Trailer Coach Manufacturers Assn.

EYES PROVE

EYES PROVE

G-E voted best picture 7 to 1

Model 21C215

BLACK-DAYLITE TV
with Ultra-Vision

General Electric
Comedy Theatre presents
RAY MILLAND
in "Alice in Wonderland"
TV & Radio
(Examine each Saturday)

GENERAL ELECTRIC

"You're not asleep. You're faking there
among the pumpkins, under the sunflower tree.
I know because once I took a last, sweet taste of free
outdoors, myself. I thought: 'Let the foolish ones learn
how to grow the finest, strongest fleece!'
When the St. Marys man came he took their
fleece and he rejected mine. It was the most terrible
day of my life...and I won't let it
happen to you! Wake up now and come along..."

St. Marys
BLANKETS
ST. MARYS, OHIO

One irreplaceable part holds the secret of better television

[illegible]

[illegible]

[illegible]

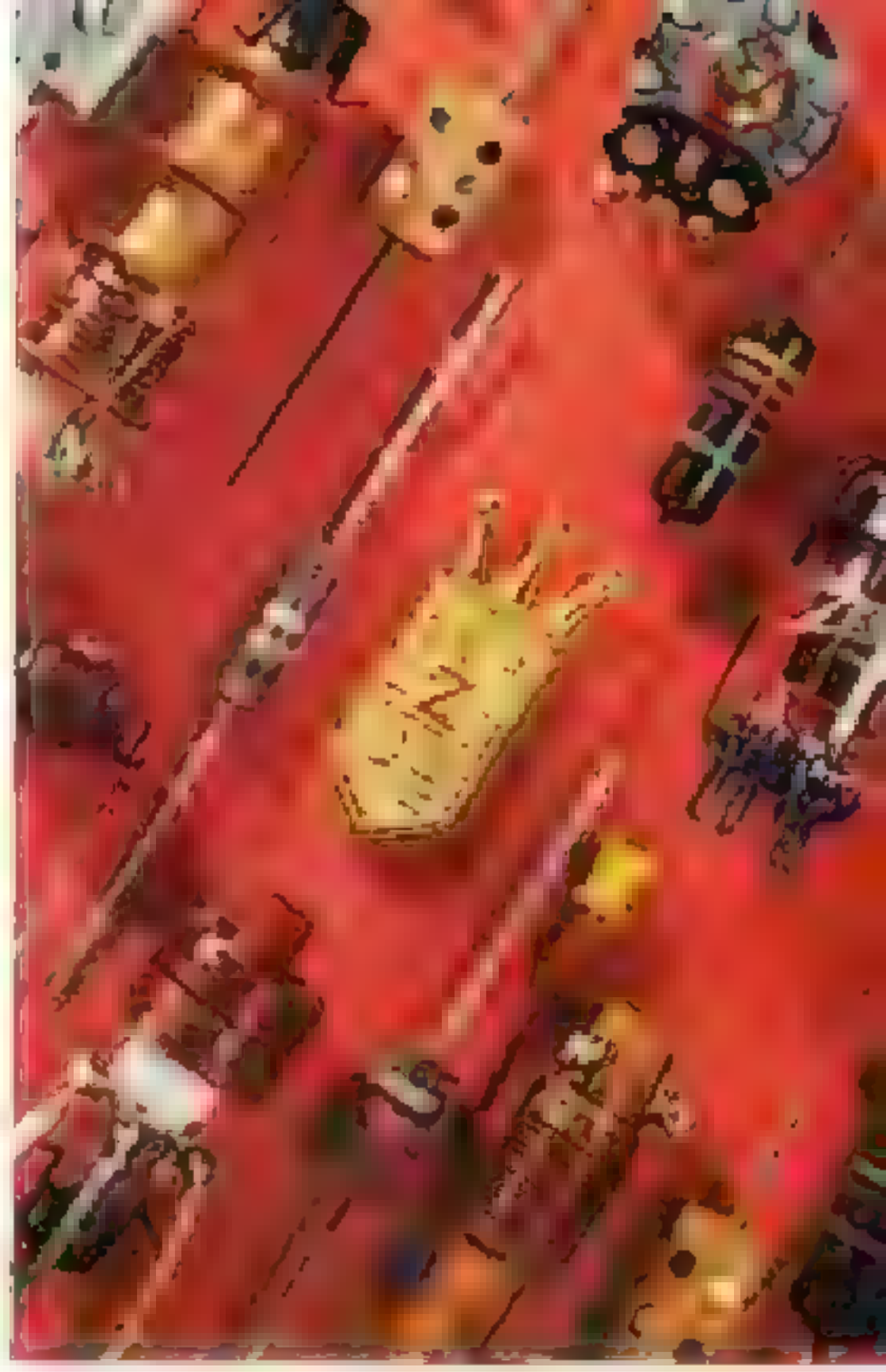
[illegible]

[illegible]

[illegible]

ZENITH

The [illegible] of radio and TELEVISION



New 1954 Zenith TV brings you the really new things you want

Brilliant new Zenith Cinebeam picture tubes [illegible]

Zenith's marvelous new Bandshell Speaker. [illegible]

Your choice of TV's 3 best ways of tuning. [illegible]

Large, lighted channel numbers [illegible]

In addition [illegible]

The Zenith Nocturne $499.95* [illegible]

Buy U.S. Savings Bonds

The PIONEERS came forward...

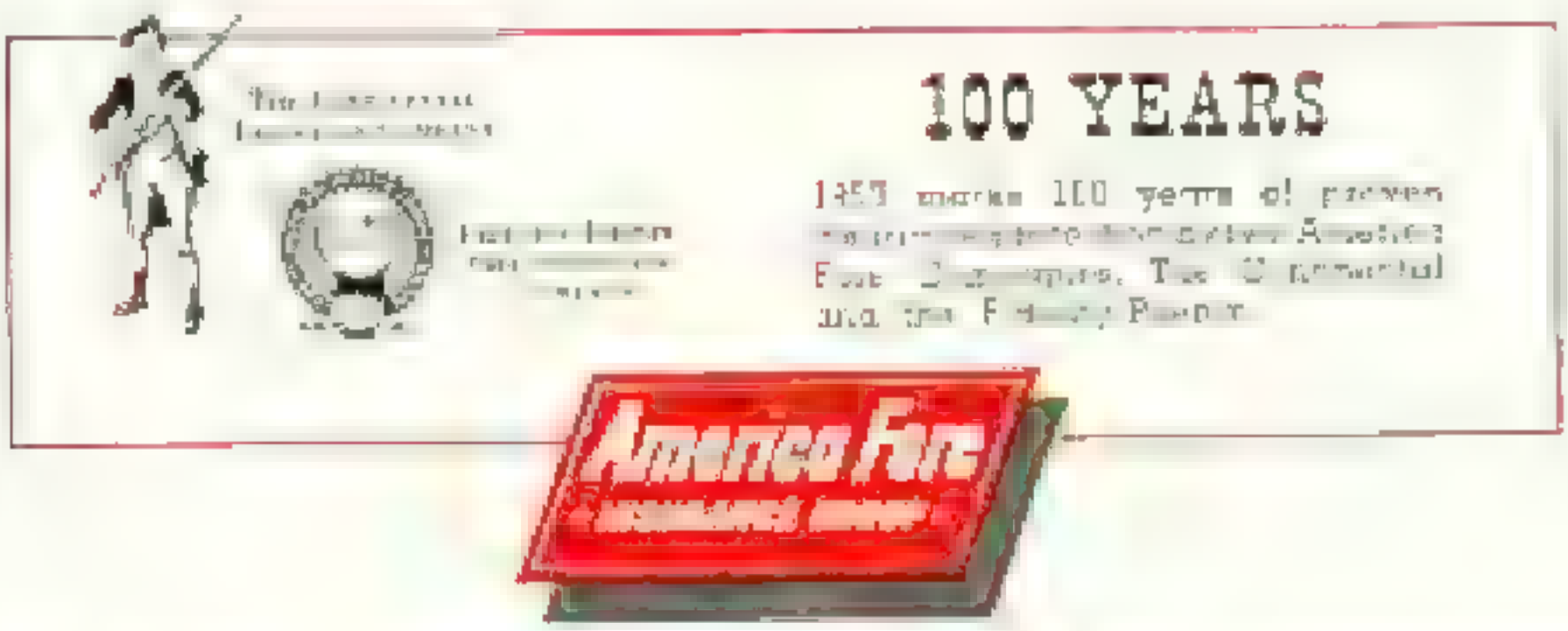
We think of pioneers as those courageous people who despite danger and hardship fought their way through forest, across prairie and desert, and expanding the frontiers of our nation.

However, in our review there also were pioneers. They were men whose courage and vision helped expand our economic frontiers.

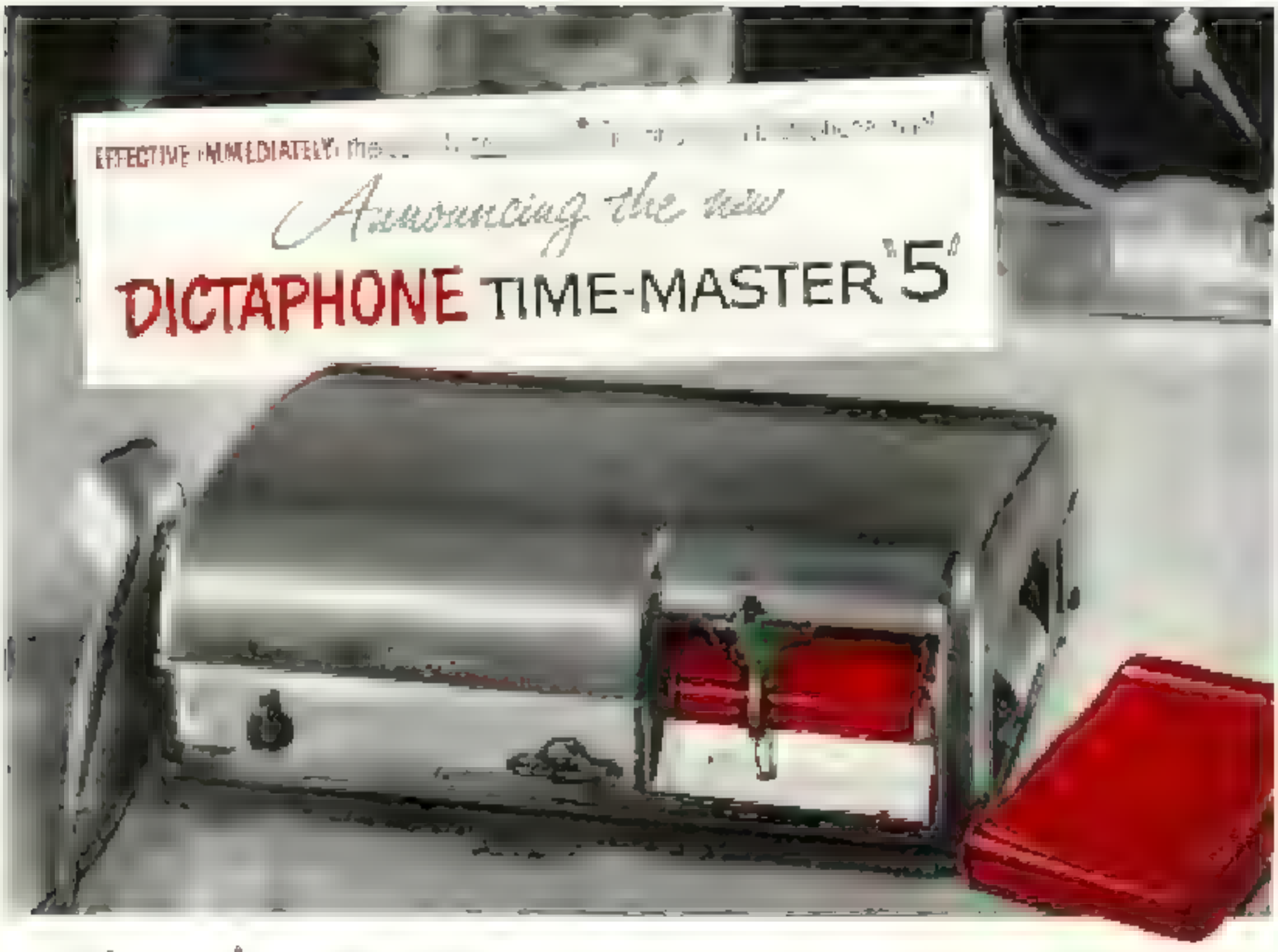
Among these were the forefathers of business men who established an industry vitally important to the growth of our nation: INSURANCE!

This year seven American insurance companies, two of which belong to the America Fore Insurance Group, celebrate their 100th anniversaries.

These founders had foresight and courage. They, too, were pioneers.



- The Continental Insurance Company
- Fidelity-Phenix Fire Insurance Company
- Niagara Fire Insurance Company
- American Eagle Fire Insurance Company
- The Fidelity and Casualty Company of New York



No other dictating machine ever build offers you all these features!

1 [illegible]
2 [illegible]
3 [illegible]
4 [illegible]
5 [illegible]
6 [illegible]
7 [illegible]
8 [illegible]
9 [illegible]

A personal message to every busy man who wants to get the best out of himself

• **If you never** have to get your thoughts on paper at all [illegible]

But if it's your [illegible] in your mind [illegible] the Dictaphone TIME-MASTER "5".

[illegible] TIME-MASTER [illegible]

[illegible] the TIME-MASTER "5" in your office. [illegible]

DICTAPHONE®

makers of the TIME-MASTER
the #1 dictating machine

CLIP THE COUPON NOW!

DICTAPHONE CORPORATION, Dept. H113
420 Lexington Ave., N. Y. 17, N. Y.

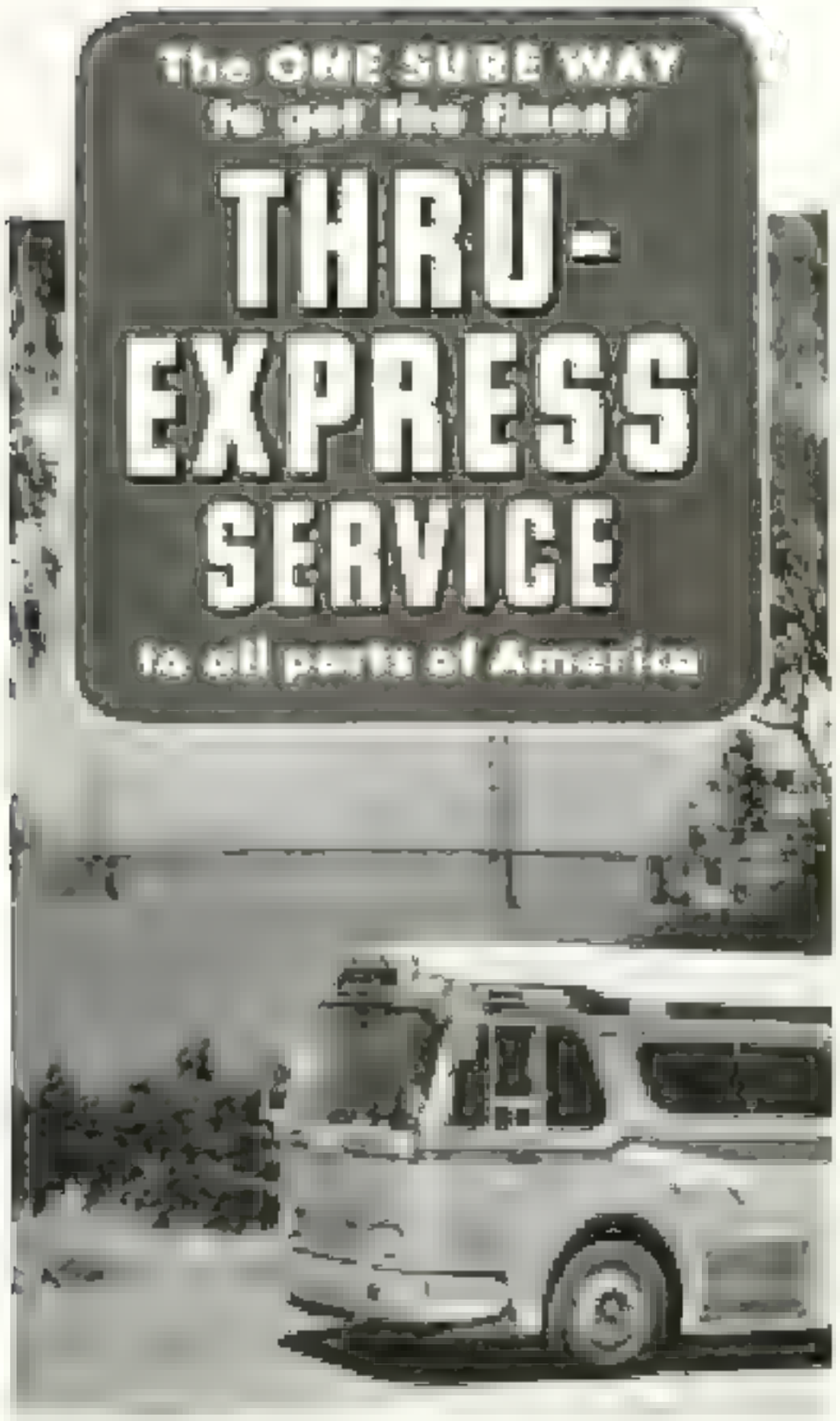
I want [illegible]
[illegible]
[illegible]

Name _____

Company _____

Street _____

City & Zone _____ State _____



Go Greyhound!

[illegible]

[illegible]

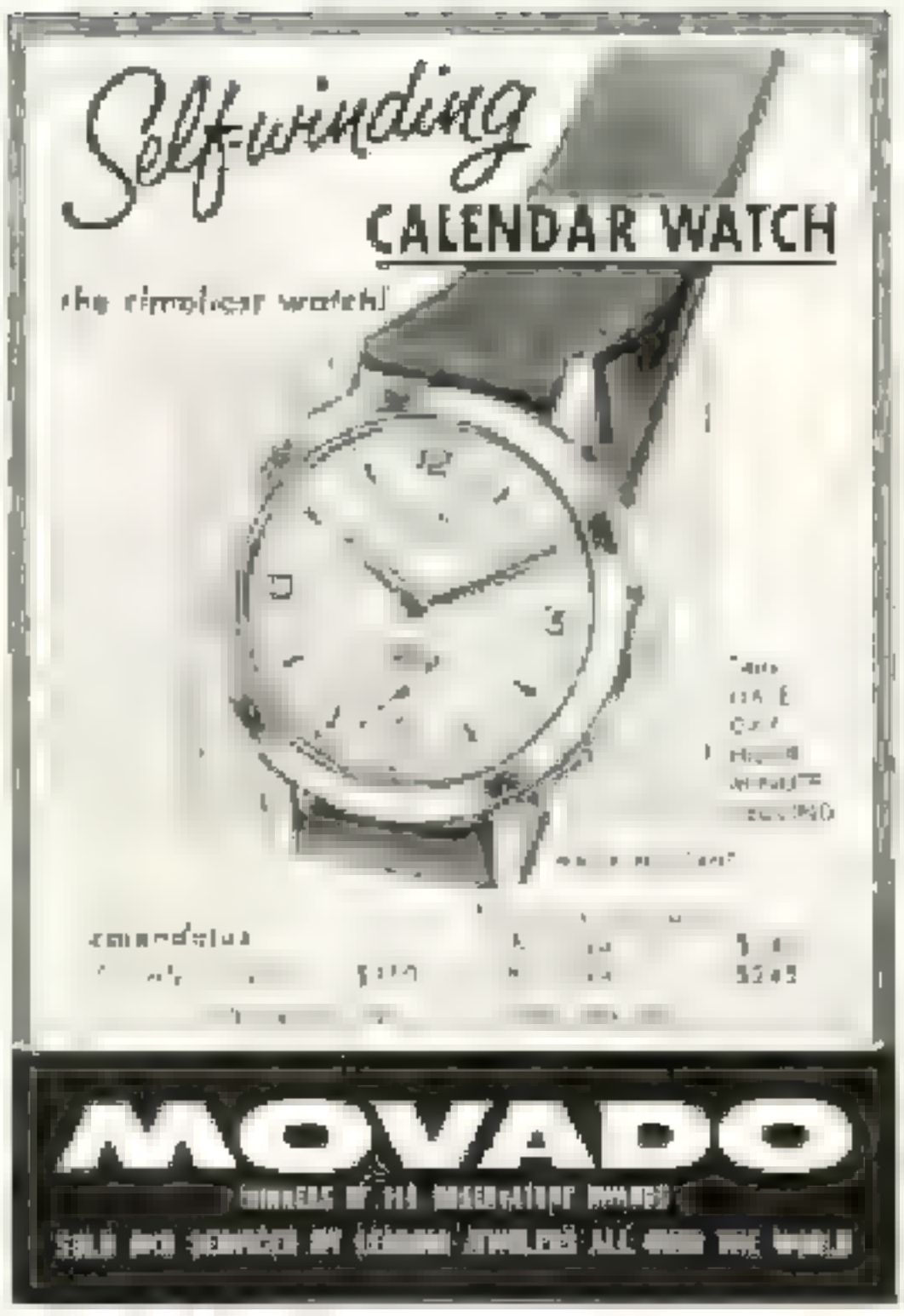
FREE! GAY PLEASURE MAP OF AMERICA

Mail to Greyhound Information Center, 71 W. Lake St., Chicago 1, Ill., [illegible]

Name

Address

City & State



DeJUR

"Dual Professional"
EXPOSURE METER

[illegible]

YOU'RE SURE WITH DeJUR

DeJUR AMSCO CORPORATION

Long Island City, N. Y. • Chicago, Ill.
Beverly Hills, Calif.

Esterbrook PENS...

...with a choice of points for every writer

The gift for comfortable writing

All points instantly interchangeable, instantly renewable. Point selection in Esterbrook more than 50 of every style.

ESTERBROOK POCKET SET.
A comfortable writing Esterbrook Pen and matching Pencil (Lift the tip to reveal the lead.) Pencil holds 12 strips of lead. Writes 5 times as many words as regular pencil. Choice of regular or [illegible] lead models

For Christmas Giving...(For Yourself, Too)

Esterbrook is the pen everyone likes because with an Esterbrook you can choose the right point for any writing style, for any writing job. Another thing, with Esterbrook Renewable point is renewable. Should a point ever get damaged, simply unscrew the old point and screw in a new one. At pen counters everywhere.

Esterbrook®
FOUNTAIN PEN

Mention the National Geographic—It identifies you

it's fun

to go to Arizona on the

Golden State

CHICAGO ★ ARIZONA ★ LOS ANGELES

YOU'LL ha[illegible] for the [illegible] Golden State [illegible] Phoenix [illegible] Palo Verde [illegible] Phoenix [illegible] Palo Verde [illegible] cars from Minneapolis [illegible]

COFFEE SHOP on the [illegible] for Chair Car passengers [illegible]

S·P

AMERICA'S MOST MODERN [illegible]

STOPOVER [illegible]

C. T. Corbett, General Passenger Agent, S.P.
[illegible] Montgomery St., San Francisco, Calif.

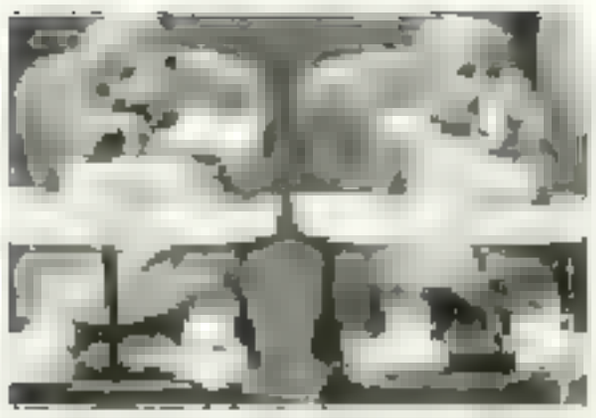
Please send me free your Informative Booklet "Wonderful Ways West"

Name

Address

City State

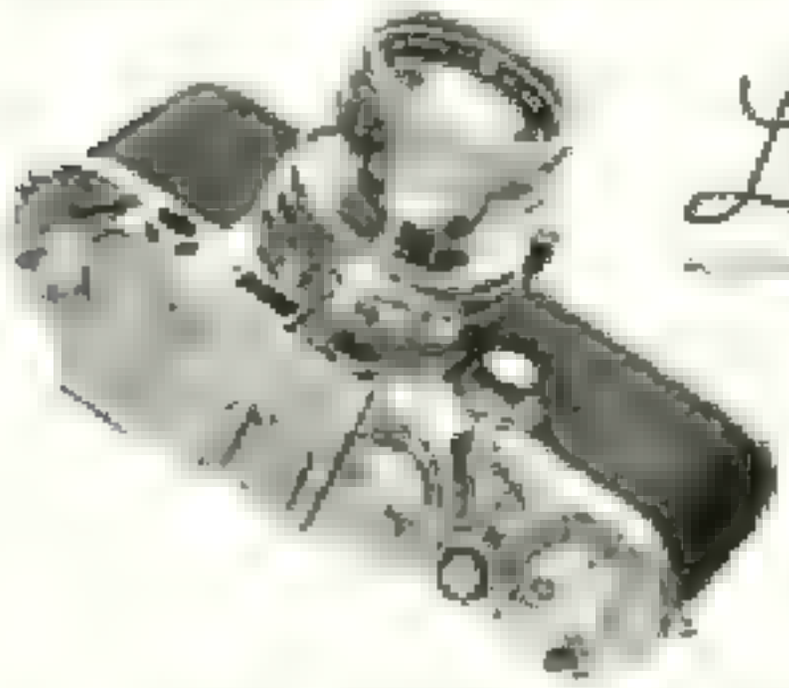
[illegible]



The LEICA is the world's most famous camera. It has journeyed through 8 dense jungles, trudged across the military tundra, gone underwater to record the awesome wonders of ocean life. For long and photographic [illegible] it performs unfailingly. For [illegible] it does likewise

The reproductions on this page are from LEICA [illegible] photos. Each [illegible] 8.5 [illegible] times. Note the clarity and detail. The results are only slightly less than the quality you can achieve with a LEICA [illegible] sports, nature, scenic and fashion

Three basic Leica models, the I, the [illegible], and the III, priced from $[illegible]. The Leica is easy to operate. It wears [illegible]. Its [illegible] is compact, light, quiet [illegible] and it has a built-in [illegible]. Two hundred accessories [illegible]



The cost of a LEICA [illegible] Ernst Leitz, Inc., [illegible] Fourth Avenue, New York 16, N. Y. [illegible] products of Ernst Leitz, Wetzlar, Germany [illegible]

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Live, play and travel the AMERICAN mobile way. Interior so light & flexible easy, carefree, satisfying, or inexpensive. Four tandem wheels, all with 4-wheel brakes. Choice of floor plans and furnishings. [illegible] for illustrated literature.

AMERICAN COACH CO., Cassopolis, Mich.

AMERICAN 35

NEW MIRACLE TUBELESS HEARING AID REVEALED

- Costly B-Battery Eliminated
- All Battery Costs Slashed 80%
- Powered by Three Transistors
- Vacuum Tubes Banished Forever

FREE BOOKS Write today for [illegible] booklet [illegible] Also [illegible] and [illegible] for [illegible] hearing [illegible] for [illegible] whatever. A [illegible] will do.

Bellone HEARING AID CO.

2900 W. 36th St., Dept. 1818, Chicago 32, Ill.

EL PASO Sunland Club
[illegible] San Francisco St., El Paso, Texas

Please send Free [illegible] Folders!

[illegible]

How the World Series got into millions of living rooms

IF YOU are ever faced with a sudden need for *lots* of things for some new product, remember the production miracle behind your TV set.

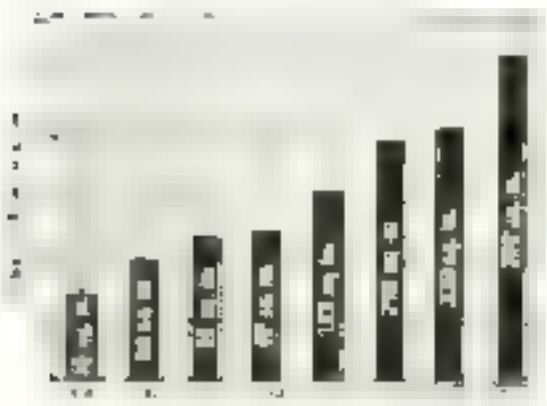
In 1946, the nation was hungry for television. But only nine thousand 7" picture tubes were produced for the entire industry. No one knew how to produce—in volume—glass parts of the required size, shape and quality.

The problem was brought to Corning Glass Works. To find the solution, Corning had to develop a new glass . . . had to improve controls . . . had to build new machines . . . had to invent wholly new manufacturing methods. This included a revolutionary, new spin-casting process which swirls molten glass into odd shapes accurately, fast, and at reasonable cost.

To keep up with mounting demands, Corning built a completely new plant and wholly revamped another. As a result of this program, Corning continues to be a major supplier of the TV industry which this year will require—and get—about eleven million picture tubes, many of them as large as 27".

What this means to you is as clear as Corning's optical glass. Corning research and manufacturing are ready to apply to your problem the same skill and effort which speeded the growth of television and many other industries.

To find out how others are using glass by Corning, write for your copy of the illustrated booklet, "Glass and You."



INCREASE IN SIZE OF PICTURE TUBES

Until 1950, most of the TV tubes produced were no larger than 17". Since then, sizes have been increased up to 27".

INCREASE IN VOLUME OF PICTURE TUBES

Since 1946, the sale of TV picture tubes has increased about [illegible] times, according to recent industry figures.

CORNING GLASS WORKS

Corning, New York

Corning means research in Glass

CORNING GLASS WORKS, 751 Crystal St., Corning, N. Y.

Please send me a copy of your new brochure, "Glass and You."

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

Wheels for the Working World

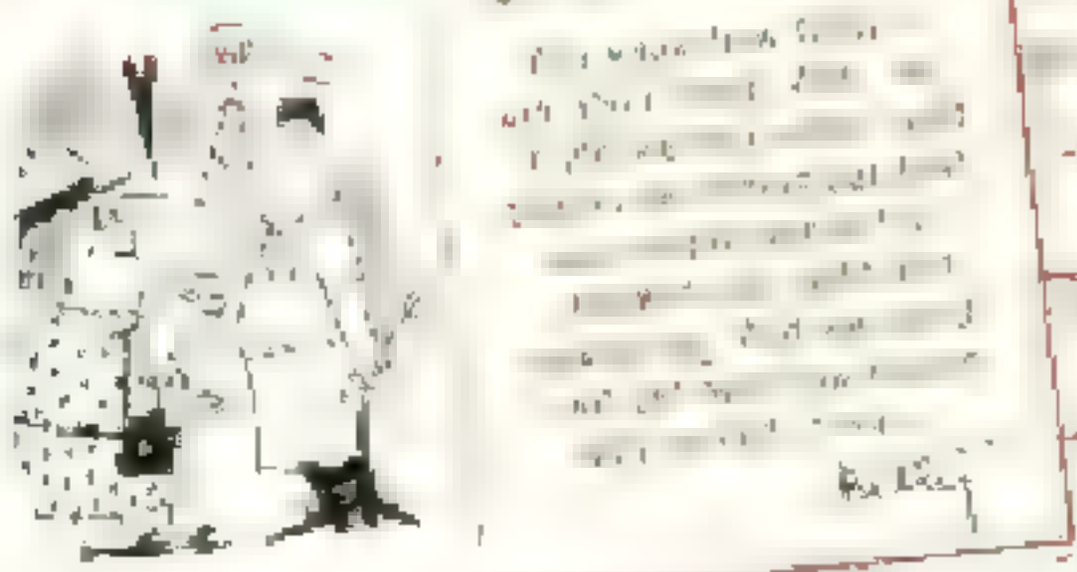
Everywhere you turn, today, you see machines on the move. Machines that lift. Machines that dig. Machines that haul. All mighty, [illegible] machines, the power of a man. And every year sees their variety expanding as invention finds new ways to bring power to a job.

The consequences of blending imagination, design and materials could not be foreseen. But we now know that the development and promotion of the steel wheel by Budd [illegible] a generation ago [illegible] immeasurably to human welfare wherever there's a highway and wherever there's work to be done.

The Budd Company, Philadelphia, Detroit, Gary

Pick a pack of postcards!

(Written aboard the most talked-about train in the country, of course!)



THE VISTA-DOME

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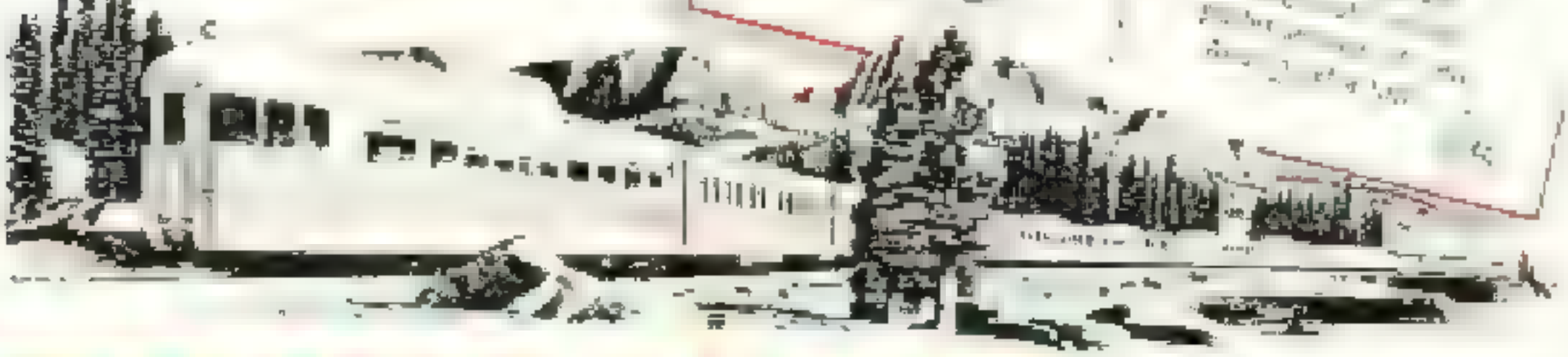
Daily between Chicago and San Francisco via Omaha, Denver and Salt Lake City on the Burlington, Rio Grande and Western Pacific Railroads

(Chair Cars and choice of Pullman accommodations, including Southern California via San Francisco without additional cost/fare)



WESTERN PACIFIC

Why so many more people are buying Chevrolets than any other car . . .

It so often happens that new friends and new [illegible] like those in our picture find a common meeting ground for conversation in their choice of a Chevrolet.

But that's not at all surprising when you consider that, year after year, more people buy Chevrolets than any other car. And this year the preference for Chevrolet [illegible] Latest available figures [illegible] 200,000 more people [illegible] bought Chevrolets than the second-choice car.

The point is that the things *they* like about Chevrolet are things *you'll* like, too.

For example, they like Chevrolet's thrifty, spirited, high-compression power and beautiful, d[illegible] Body by Fisher—and so will you.

They like the extra convenience of Chevrolet's [illegible] expansive Powerglide automatic transmission* . . . the extra handling ease and driving safety offered by Chevrolet Power Steering*—[illegible]

And there [illegible] more you'll like about Chevrolet. [illegible] *proved time in the [illegible]*

[illegible] Chevrolet [illegible] Motors Division, Detroit 2, Michigan.

*[illegible]

MORE PEOPLE BUY CHEVROLETS THAN ANY OTHER CAR!

CHEVROLET

FALSE TEETH OFTEN HAVE A CERTAIN ODOR!

Keep Teeth Naturally White and Free from Offensive Odor—Without Brushing!

Your dentist [illegible] 60% [illegible] that natural teeth is easily scratched by brushing with toothpaste or powder. These scratches allow food particles, other impurities to collect faster, stain tighter, cause denture breath.

So start right today—and every day, clean your plates the way most dentists recommend—with Polident. A soak—a rinse—a clean fresh mouth! Your teeth stay naturally white and odor-free.

No danger from abrasive [illegible] Not aware of Denture Breath? Get Polident [illegible] satisfy, or money back.

World's Largest Selling Denture Cleanser

POLIDENT

Recommended by More Dentists Than Any Other

BALANCE is important in DIABETES, too . . .

In a way, the skillful performer on the [illegible] and people with diabetes have certain [illegible] in common.

The [illegible] must be [illegible] concerned with [illegible] lives.

The three essential factors which diabetics must keep in proper balance are diet, exercise, and insulin.

1. Diet is a vital part of the treatment of most diabetics. In many mild cases, [illegible] the disease.

2. Exercise, or active work, is also important in the treatment of diabetes, because it helps to increase the ability of the body to use sugars and starches.

3. Insulin does not cure the disease, but it has given diabetics a new lease on life. Insulin enables diabetics to utilize food and convert it into energy [illegible]

[illegible] and [illegible] of [illegible] now make [illegible] from effective control of diabetes. Many research [illegible] are now under way to learn more about the chemistry of insulin and how it is used by the [illegible]. These and other investigations will probably bring [illegible] hopeful outlook for most diabetics.

When discovered early, diabetes is easier to control and [illegible] complications can often be avoided. [illegible], diabetes can be readily detected by having a [illegible] periodically with a [illegible] test. This usually permits the [illegible] before the [illegible] appear.

[illegible]

Metropolitan Life also [illegible] facts about the progress made by medical science in the treatment of diabetes, and information which may be helpful in guarding against this disease.

Metropolitan Life
Insurance Company

Name
Street
City State

Diabetes

is not a banker . . .

yet is a specialist who can give you expert advice on your future security?

is not a doctor . . .

yet is a trusted consultant to whom many a family owes its continued well-being?

is not an architect . . .

yet spends his life blueprinting plans to help people build for the future?

He's a useful sort of man to know . . . and you'll find him in thousands of communities across the country.

He's your local Travelers agent or broker—always available to sit down with you, to work out the plan of personal or business insurance that exactly fits your needs.

Why not get in touch with him? If you don't know the name and address of The Travelers man nearest you, just drop us a line.

The Travelers

Kodak

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For the man who wants his movies BIG . . . [illegible] CINE KODAK ROYAL MAGAZINE CAMERA, $176.25

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Here for your Christmas giving is a collection of superb movie-making and movie-showing equipment. It reflects quality and performance Kodak's many years of experience in the field of motion picture photography. Other fine Kodak movie cameras from $92.75. See them at your dealer's soon!

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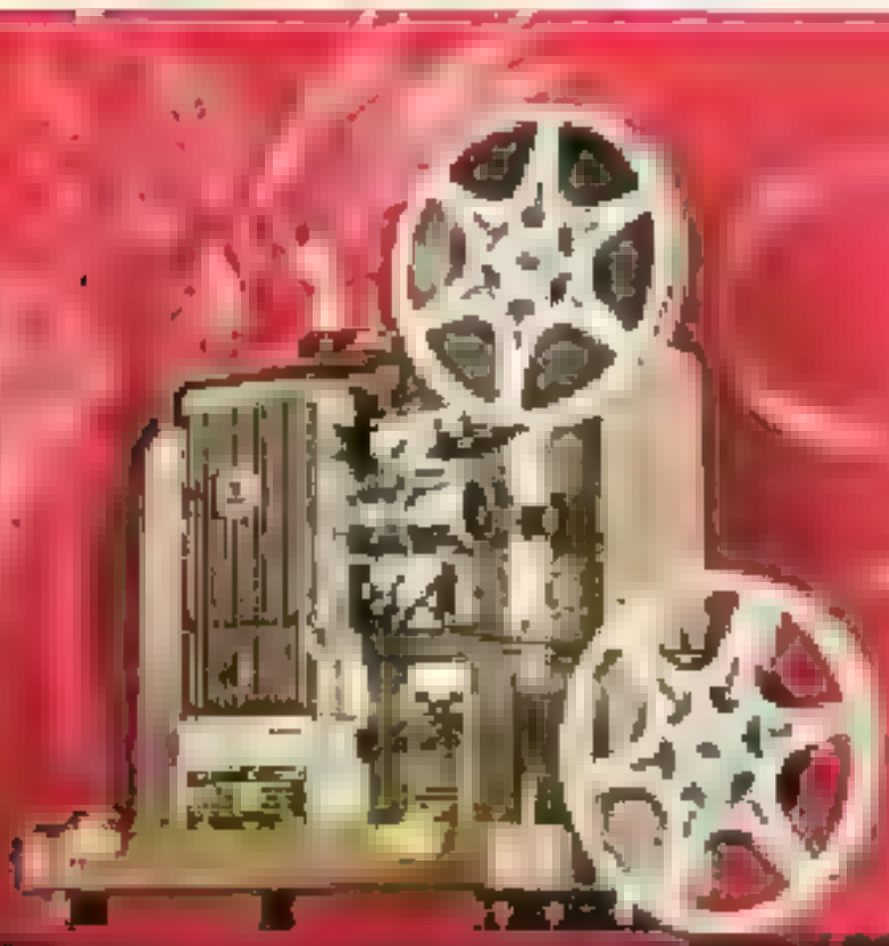
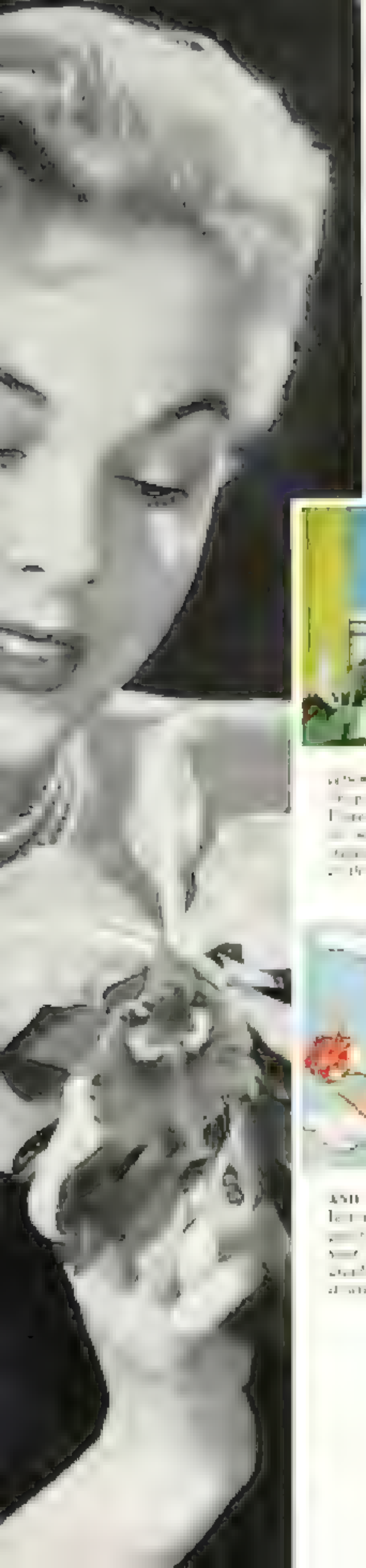
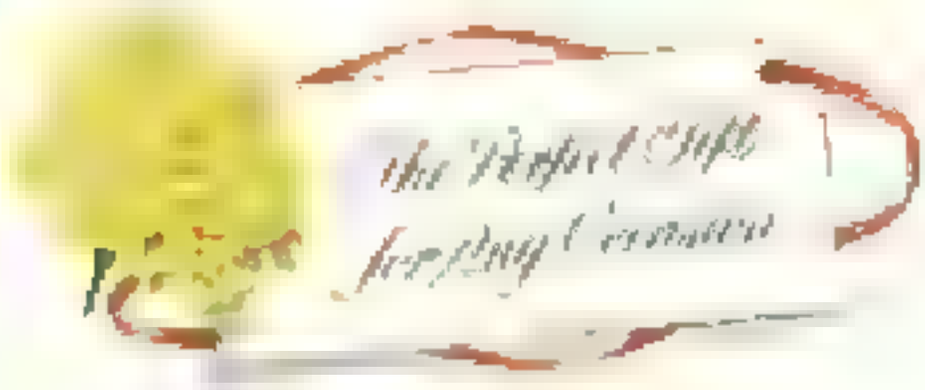
For your own private movie theater . . . [illegible] KODASCOPE PAGEANT SOUND PROJECTOR, $375

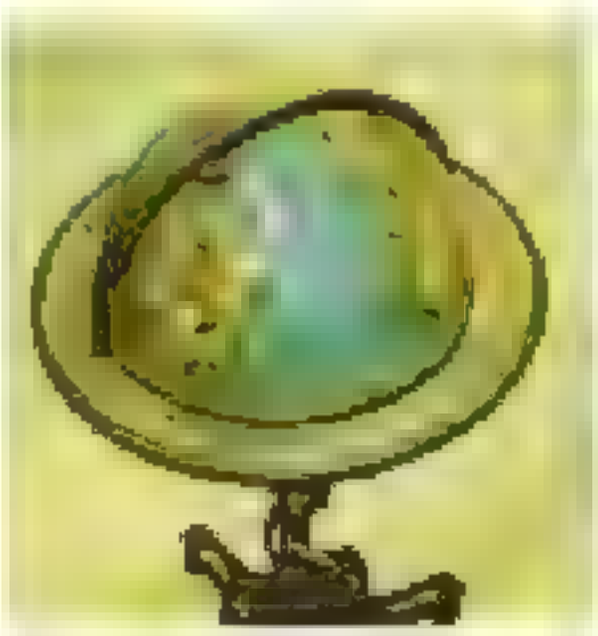
Prices include Federal Tax where applicable [illegible]





It's "All-Ways" Better to Say it with Flowers-By-Wire





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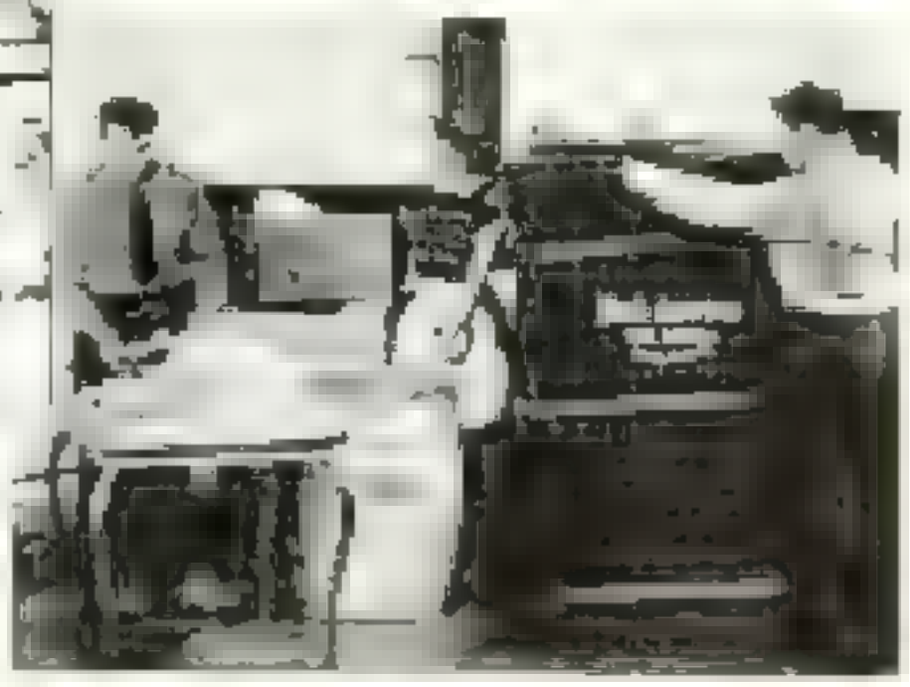

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You'll find you save time on Long Distance calls when you give the operator the number you want. This booklet helps you keep the numbers handy.

There's a copy for you at the nearest Bell telephone office.

Save time . . . call by number

So use the booklet to write down the numbers you already know. If there's a new number you don't have — or an old one you've forgotten — be sure to add it to the list when the operator gives it to you.

BELL TELEPHONE SYSTEM